



NSU Strategic Research Plan 2024 - 2028



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Introduction from Director, Office of Research-NSU

1. On 18 January 2024, Prof. Dr. Norman K. Swazo, Director, Office of Research-NSU (OR-NSU), delivered to Prof. Dr. Atiqul Islam, NSU Vice Chancellor, a document entitled “School Evaluation Reports on Research Productivity 2019-2023.” The document included reports providing an assessment of School and Department research performance over the first five-year strategic research planning period from 2019-2023, accounting for respective School *strategic research priorities* and *department research targets* identified in 2019 at the start of the five-year plan period.
2. Notably, all Schools remain committed to the **NSU Research Vision and Mission Statements**, accepted and approved by the NSU Board of Trustees, as follows:

Research Vision Statement

With a vision to foster achievement of national, regional, and global sustainable development through its research productivity, North South University aspires to be a globally recognized Center of Excellence in higher education.

Research Mission Statement

North South University aspires to an institutional research capacity that

- Is diversified among basic and applied research
 - Supports and contributes to the National Research Strategy
 - Assures the public of its research integrity in the conduct of its scientists and scholars
 - Promotes inter-institutional and international cooperative and collaborative research opportunities
 - Advances local science and technology innovation through international research collaboration as well as collaboration with government, professions, and industry
 - Promotes and disseminates research outcomes having research impact
 - Is integrated with its teaching–learning mission
3. Subsequent to submittal of School Evaluation Reports, the four School Deans, four School Research Coordinators, and sixteen Department Chairpersons (four per School) engaged in intra-School discussions about the research performance data presented therein; with a view to these data informing the next five-year strategic research plan for the period 2024-2028. With guidance from the Director, OR-NSU, the School Research Coordinators and

School Deans initiated discussions with Department Chairpersons to identify School **strategic research priorities** and specified **department research targets** across a range of research activities. Where applicable, research priorities and targets were to be identified also for research institutes and research centers within each respective School.

4. With authorization from the Vice Chancellor, the Director, OR-NSU, constituted a new **NSU Research Strategy Task Force (NSU RSTF)**, comprised of the following members:
 - Prof. Dr. Norman K. Swazo, Director, Office of Research-NSU (Convener)
 - Prof. Dr. Helal Ahammad, Dean, School of Business and Economics (SBE)
 - Prof. Dr. Javed Bari, Dean, School of Engineering and Physical Sciences (SEPS) - subsequently replaced by Prof. Dr. Mohammad Sahadet Hossain as new Dean, SEPS
 - Prof. Dr. Hasan M. Reza, Dean, School of Health and Life Sciences (SHLS) - subsequently replaced by Prof. Dr. Dipak Kumar Mitra as new Dean, SHLS
 - Prof. Dr. Tawfique M. Haque, Acting Dean, School of Humanities and Social Sciences (SHSS)
 - Assoc. Prof. Dr. Mahmud Hassan, SBE School Research Coordinator
 - Prof. Dr. Mamun Molla, SEPS School Research Coordinator
 - Assoc. Prof. Dr. Mainul Hossain, SHLS School Research Coordinator
 - Prof. Dr. Mahbubur Rahman, SHSS School Research Coordinator - subsequently replaced by Prof. Dr. Mohammad Nuruzzaman as new SHSS Research Coordinator
 - Prof. Dr. Arifur Rahman, Chair, SBE School Scientific Review Committee
 - Assoc. Prof. Dr. Muhammad Asad Uz Zaman, Chair, SEPS School Scientific Review Committee
 - Prof. Dr. Abdul Khaleque, Chair, SHLS School Scientific Review Committee
 - Prof. Dr. AQMA Rahman Bhuiyan, Chair, SHSS School Scientific Review Committee
 - Prof. Dr. Biswas Karabi Farhana, Director, Office of Graduate Studies

5. Each School was tasked to develop a **School Strategic Research Plan 2024-2028**, with an initial (Powerpoint) summary presentation to be given to the Vice Chancellor at a meeting of the NSU RSTF convened by the Director, OR-NSU. That meeting was held on 21 March 2024 in the Vice Chancellor's Conference Room.
 - a. After listening to the various School presentations, the Vice Chancellor approved the initially identified School strategic research priorities and department research

- targets (across a range of categories as specified in a template provided by OR-NSU).
- b. The Vice Chancellor emphasized the need for improved performance in the publication of SCOPUS-indexed journal articles across all Schools, since such indexing not only reflects the quality of NSU faculty research, but also because such publication metrics are essential to NSU's institutional rankings (Times Higher Education and QS Asia).
 - c. The Vice Chancellor also concurred on the need to intensify recruitment of PhD-level faculty, especially *senior rank* faculty who can (i) mentor junior faculty, (ii) form research clusters within the Schools, (iii) enhance faculty research productivity, and (iv) leverage extramural research grant funding. (The Chairman, NSU Board of Trustees, has emphasized to the Director, OR-NSU, the importance of the latter objective of increasing extramural research grant funding, notwithstanding ongoing improvement in the appropriation of NSU research grants to the faculty.)
 - d. All members of the NSU RSTF understand that the private universities in Bangladesh, including NSU, continue to work towards Ministry of Education and University Grants Commission (UGC) approval of a limited number of PhD degree granting programs at private universities that have the requisite financial, material, and human resources and research infrastructure to do so. Clearly, having PhD degree seeking students at NSU working as research associates/assistants to faculty will contribute substantially to core faculty research productivity.
 - e. With the Vice Chancellor concurring, it was recommended that senior faculty recruitment be expedited through a new "Faculty Applicant Portal," with expedited School/Department level review and evaluation consistent with NSU recruitment criteria. This is to be arranged in due course in discussion with the Deputy Director/Faculty HR. (Notably, the NSU Academic Council is yet to approve the revised NSU Faculty Recruitment & Promotion criteria recommended by an ad hoc committee. It is expected this will be finalized and engaged on the agenda of a forthcoming Academic Council meeting.)
6. After the NSU RSTF meeting, the Vice Chancellor directed the Director, OR-NSU, to finalize the collated NSU Strategic Research Plan 2024-2028 for delivery to him by 30 April 2024 (extension granted to 05 May due to VC's out-of-country travel).
 7. Each School team has worked carefully to finalize School strategic research priorities and department research targets for the plan period 2024-2028. The School Strategic Research

Plans are presented here in the following sections of this composite NSU Strategic Research Plan 2024-2028 document.

8. There is every indication that the School plans are realistic and for the most part feasible over the designated plan period. However,
 - a. In some cases the Schools have not adequately differentiated “School”-level priorities such that they actually superintend (orient, guide) “Department”/“Research Institute”-level research agendas and identified annual targets. Stated “priorities” basically track faculty research specializations within the departments. But, clearly, not all such “priorities” can be engaged realistically relative to recurrent budgeting. Delineation of principal School-level strategic research priorities is especially essential in view of forthcoming recurrent budgeting that will require more explicit selection of School-level priorities relative to Board of Trustees-approval of unit budgets and thus allocation of resources (personnel, equipment, materials, supplies, etc.) across Departments and Research Institutes/Centers. Successful implementation of these Plans will depend *inter alia* on higher authority approval of the recurrent budgets of Schools, Departments, Institutes, and Centers that are soon to be formulated and submitted for approval, starting with the recurrent budget for FY2024-2025 (July-June).
 - b. It is expected that core faculty research productivity will be improved over the five-year Plan period, assuming:
 - (i) Reduction of the current annual (bi-semester) instructional workload of 5 courses per semester (as already approved for implementation, according to the statement of the Board of Trustees (BOT) Chairman in a meeting with senior administrators held in AUD 801 on 21 April);
 - (ii) Improved recruitment of full-time core faculty (Assistant Professor rank and above) in view of the desired university student/faculty ratio, with graduated diminished reliance on the local pool of adjunct instructors as reasonable in relation to student enrollment demand each semester and revenue;
 - (iii) Implementation of the Faculty Performance Evaluation System (FPES), as directed by the Vice Chancellor, designed to be formative in enhancing core faculty professional development in relation to total tripartite workload (teaching, research, and university, community, and/or professional service); and,
 - (iv) BOT approval of the proposed revisions to the Faculty Promotion/Recruitment Criteria (now pending final Academic Council

review and recommended approval for transmittal to the Syndicate and the BOT for final approval).

- c. It is also important that each School major “**Research Institute/Center**” is expected to work to:
- (i) *Formalize faculty affiliations* (inclusive of NSU full-time faculty, visiting faculty, professorial and/or postdoctoral fellows, and research associates);
 - (ii) *Arrange for interdepartmentally shared use of research laboratory space and laboratory equipment across departments.* This is essential to avoid duplicate purchasing and/or unnecessary restrictions on the use of equipment that can be used interdepartmentally, as long as given faculty members have the requisite training and expertise as part of approved research projects. This is especially salient as a matter of standard operating procedures (SOP) and laboratory research practices in SHLS related to the operations of the Advanced Bioscience Research Center (ABRC), the Genome Research Institute (NGRI), and the Global Health Institute (GHI) (*Directors of these centers of research are expected to have SOPs in place for use of facility/laboratory space and available equipment*).

Further, the Advanced Bioscience Research Center was funded initially for Phase 1 of planned operations. It is important that this Center have an appointed Director and planning for Phase 2 be engaged for efficacy of Center operations as an “advanced” research center.

Subject to review and approval from the NSU Institutional Biosafety Committee, the SHLS will also have to work to assure compliance with biosafety and biosecurity standards in relation to expected Biosafety Level 2 (BSL-2) research undertaken during the Plan period. It is unclear where BSL-2 research will be conducted, although there is reference to the ABRC as the locus for this. The current location of the ABRC with residential buildings in proximity is not conducive to such research, depending on the microorganisms involved in the research and whether there is adequate air filtration in the air-exhaust mechanisms in lab spaces. It may be that a separate facility has to be designated for BSL-2 research projects.

- (iii) *Formulate annual operating budgets* (to be submitted according to a process approved and implemented by the Treasurer for the recurrent budget Fiscal Year July 2024 - June 2025); and,

- (iv) *Develop, maintain, and improve websites, increasing public visibility of the Institutes, thus to showcase research expertise and ongoing research projects to the public at large, but also to leverage opportunities for international inter-institutional research collaborations.*

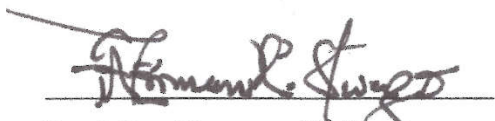
The foregoing actions are important to intensify “Institute-level” research agendas and research productivity, but also to ensure an improved rate of successful applications for large-scale, multi-year-duration extramural research grants involving inter-institutional research collaborations (both national and international). These aspirations apply to:

- Economics Research Platform (ERP/SBE)
 - Center for Business Research (CBR/SBE)
 - NSU-UWA Agribusiness Center of Excellence (ACE/SBE)
 - Global Health Institute (GHI/SHLS)
 - NSU Genome Research Institute (NGRI/SHLS)
 - Advanced Bioscience Research Center (ABRC/SHLS)
 - South Asian Institute of Policy and Governance (SIPG/SHSS)—which already has formalized faculty affiliation, subsidiary centers of research, affiliated faculty research agendas, and an annual operating budget;
 - The proposed Institute for Technological Innovation (ITI/SEPS) that is expected to become operational during the midpoint of the 2024-2028 strategic research plan period; and,
 - The proposed Artificial Intelligence Institute (AII/SEPS) that is expected to become operational by the end of the plan period.
- d. Further, NSU School administrators and faculty understand that the Vice Chancellor has set a goal of moving NSU from *research-active* to near *research-intensive* university status by the end of the 2024-2028 strategic research plan period. The transition from *ad hoc* approval of expenditures to a formal university-wide recurrent budget for FY2024-2025 will substantially contribute to this goal consistent with the strategic research planning set in this Plan for Schools, research institutes, and research centers.
- e. As noted earlier in a meeting of various senior faculty and administrators with the BOT Chairman as well as in a formal written communication to the BOT Chairman from the Director, OR-NSU (submitted in response to BOT Chairman’s request for research data), it is strongly recommended that NSU initiate discussions with a select number of private and/or public universities in Bangladesh to establish an **Inter-University Research Consortium**. The purpose of this Consortium is (i) to

aggregate research grant funding specifically for *large-scale, multi-year, funded research projects* for which faculties of the Consortium member institutions could apply and (ii) to leverage international and industry research funding. This initiative could begin with the Vice Chancellor authorizing an initial meeting here at NSU, to be attended by Vice Chancellors and relevant Directors of Research from a select number of institutions. The Director, OR-NSU, can convene the inaugural session with the goal of discussing organizational issues and, in a technical working session, to identify and recommend transition strategies to implement the Consortium.

On behalf of the
NSU Research Strategy Task Force,

Respectfully submitted,



Prof. Dr. Norman K. Swazo
Director, Office of Research-NSU
Professor of Philosophy, SHSS
05 May 2024

As approved,



Prof. Dr. Atiqul Islam

Vice Chancellor

Date: 05-05-2024

School of Business and Economics

Strategic Research Plan 2024-2028

Overview

North South University (NSU), the first private university in Bangladesh, was established in 1992. NSU has been ranked as the number one university in Bangladesh in the Times Higher Education's (THE) 2023 World University Ranking. It was also ranked as the best private university in Bangladesh on QS World University Ranking 2023. NSU is the only private university in Bangladesh to secure a spot in the QS Graduate Employability Ranking 2022.

NSU SBE is one of the leading business schools in Bangladesh. It is well-known in Bangladesh to develop professionals - many of whom are leading his/her organizations - equipping its students with essential skills: empowering them with disciplinary knowledge needed in the evolving world as well as spurring them to strive and remain at the top of their professions with continuous learning and sustainable practices.

The latest QS World University Rankings by Subject has placed SBE among the top 351 – 400 schools in the subject area of Business and Management Studies, globally!

The faculty team in NSU SBE comprises academic scholars and practicing business professionals. The core faculty members at SBE hold at least one postgraduate degree from an overseas university including in North America, Europe, Australia, or New-Zealand. The areas of teaching and research interest of faculty members cut across accounting & finance, economics, marketing, international business, and management. The school has state-of-the-art facilities that provide effective user-friendly teaching and learning environments for its students, faculty members, and staff.

In 2015, NSU SBE became the first in Bangladesh to receive the American Accreditation Council for Business Schools and Programs (ACBSP) accreditation for its programs. The school is also a member of the UK-based Chartered Association of Business Schools (CABS).

NSU SBE offers the following degree programs:

1. Bachelor of Business Administration (BBA);
2. Bachelor of Science in Economics (BS in Economics);
3. Master of Business Administration (MBA);
4. Executive Master of Business Administration (EMBA);
5. Master of Science in Economics (MS in Economics);
6. Master of Development Studies (MDS)

In addition, NSU SBE runs a few certificate programs such as the City Alo Certification Program.

Vision

To be a globally recognized school of business and economics.

Mission

To foster business leaders who can deliver sustainable economic and social value. The school is doing so by:

- Innovating in its teaching and learning to create socially and ethically responsible, competent future professionals and leaders.
- Encouraging quality research to produce useful and impactful knowledge for industry, government, and the society.
- Offering a life-long learning experience through a range of co-curricular and extracurricular activities and also through ‘certificate’ programs that equip students with the skills and attitude to excel in a dynamic world.
- Emphasizing external collaborations to address local, regional, and global business and environmental challenges.
- Working as ‘one team’ to achieve our shared vision.

SBE’s Research Priorities

- Developing a sustainable and proactive research culture.
- Supporting faculty development for impactful research.
- Promoting interdisciplinary research through partnerships and collaboration.
- Adopting an ‘aggressive’ faculty-recruitment drive.

SBE’s Research Action Plan

- To recruit research-active, highly-qualified academic scholars.
- To boost research and outreach activities by departments and research centers (CBR, ACE, & ERP).
- To introduce a school-specific workload framework in keeping with *NSU’s stated ‘expectations’ from its faculty members*; and to assign teaching, research and administrative responsibilities to individual faculty members.
- To encourage and map out the socially impactful research.
- To introduce research awards for early-career and seasoned researchers.
- To include *North South Business Review* in the SCOPUS index.
- To organize international conferences.
- To attract more research grants and institutional funding for undertaking high-quality, collaborative research.

Planned Research Activities of SBE (All Departments)

Target Categories	2024	2025	2026	2027	2028	Total
Journal Articles	65	65	70	70	75	345
Journal						
Books	2	3	3	3	3	14
Book Chapters	2	5	2	5	5	19
Edited Books						
Edited Volumes						
Business Cases	6	6	6	6	6	30
International Conferences	1	1		1	1	4
Conference Presentations	12	12	15	18	18	75
Conference Proceedings						
Policy briefs						
Working Papers/ Presentations	10	10	14	15	16	65
Department Symposium	8	8	9	9	9	43
Inter-institutional research collaborations (local)	7	8	9	10	13	47
Inter-institutional research collaborations with foreign universities/ Institutes	8	8	11	12	12	51
NSU research grants number	22	22	27	27	27	125
Extramural research grants	1	1	3	2	3	10
Establish new research labs or centers						
Others (Research Seminar/ Webinars/ Workshop)	11	11	11	11	11	55

Department of Accounting and Finance

Target Categories	2024	2025	2026	2027	2028	Total
Journal Articles	9	9	10	10	11	49
Journal						
Books		1	1	1	1	4
Book Chapters	1	1	1	1	1	5
Edited Books						
Edited Volumes						
Business Cases						
International Conferences	1					1
Conference Presentations	3	3	4	5	5	20

Conference Proceedings						
Policy briefs						
Working Papers/ Presentations	5	5	7	7	8	32
Department Symposium	2	2	2	2	2	10
Inter-institutional research collaborations (local)	1	2	1	2	3	9
Inter-institutional research collaborations with foreign universities/ Institutes	1	1	2	2	2	8
NSU research grants number	3	3	4	4	4	18
Extramural research grants			1		1	2
Establish new research labs or centers						
Others (Research Seminar/ Webinars/ Workshop)	2	2	2	2	2	10

Department of Economics

Target Categories	2024	2025	2026	2027	2028	Total
Journal Articles	18	18	19	19	20	94
Journal						
Books	1		1			2
Book Chapters		2		2	2	6
Edited Books						
Edited Volumes						
Business Cases						
International Conferences		1				1
Conference Presentations	3	3	4	4	4	18
Conference Proceedings						
Policy briefs						
Working Papers/ Presentations	2	2	3	3	3	13
Department Symposium	1	1	2	2	2	8
Inter-institutional research collaborations (local)	1	1	2	2	2	8
Inter-institutional research collaborations with foreign universities/ Institutes	2	2	3	3	3	13
NSU research grants number	4	4	5	5	5	23
Extramural research grants	1	1	2	2	2	8
Establish new research labs or centers						
Others (Research Seminar/ Webinars/ Workshop)	3	3	3	3	3	15

Department of Management

Target Categories	2024	2025	2026	2027	2028	Total
Journal Articles	18	18	20	20	21	97
Journal						
Books	1	1	1	1	1	5
Book Chapters	1	1	1	1	1	5
Edited Books						
Edited Volumes						
Business Cases	6	6	6	6	6	30
International Conferences				1		1
Conference Presentations	3	3	4	5	5	20
Conference Proceedings						
Policy briefs						
Working Papers/ Presentations	1	1	2	2	2	8
Department Symposium	2	2	2	2	2	10
Inter-institutional research collaborations (local)	3	3	4	4	5	19
Inter-institutional research collaborations with foreign universities/ Institutes	3	3	4	4	5	19
NSU research grants number	8	8	10	10	10	46
Extramural research grants						
Establish new research labs or centers						
Others (Research Seminar/ Webinars/ Workshop)	2	2	2	2	2	10

Department of Marketing and International Business

Target Categories	2024	2025	2026	2027	2028	Total
Journal Articles	20	20	21	21	23	107
Journal						
Books		1		1	1	3
Book Chapters		1		1	1	3
Edited Books						
Edited Volumes						
Business Cases						

International Conferences					1	1
Conference Presentations	3	3	3	4	4	17
Conference Proceedings						
Policy briefs						
Working Papers/ Presentations	2	2	2	3	3	12
Department Symposium	3	3	3	3	3	15
Inter-institutional research collaborations (local)	2	2	2	2	3	10
Inter-institutional research collaborations with foreign universities/ Institutes	2	2	2	3	2	11
NSU research grants number	7	7	8	8	8	38
Extramural research grants						
Establish new research labs or centers						
Others (Research Seminar/ Webinars/ Workshop)	4	4	4	4	4	20

Economics Research Platform (ERP)

- The Economics Research Platform needs to develop the budget for the fiscal year 2024-25.
- ERP needs to develop the formal faculty affiliation.
- It is working on upgrading its website which will showcase the faculty affiliation and the research expertise of its faculty associates.
- It is working on enhancing the visibility and discoverability of its website.
- ERP is to further build and maintain strategic partnerships with leading research institutions, development partners and apex policy making bodies.
- It is also to foster research capacity through structured training programs and access to research infrastructure including sound analytical frameworks and critical datasets, for students, budding researchers and future industry leaders.

Center for Business Research (CBR)

The NSU Center for Business Research (NSU-CBR) aims to focus on fostering research and innovation, advancing business knowledge and development, facilitating intellectual exchange and collaboration, and establishing thought leadership in the field. The NSU-CBR serves as a dynamic hub for scholars, entrepreneurs, industry leaders, and policymakers. The NSU Center for Business Research is managed by a Director and an Advisory Committee.

Five-Year Plan

Dedicated office space and office staff

- Establish a dedicated office space for NSU-CBR. Hire an Administrative Assistant and an Office Support Assistant.

Hire research-intensive scholars and visiting professors

- Subject to budgetary availability, recruit a research-intensive scholar who will work with NSU-CBR as a Research Fellow to increase SBE's grants and research productivity.
- Host visiting professors and post-doc researchers to enhance our research productivity.

Formal affiliation with research-intensive faculty

- Establish formal affiliation with research-intensive faculty and scholars within NSU and externally.

Neuromarketing Research and AI Business Lab

- Establish a state-of-the-art Neuromarketing Research and AI Business Lab. Recruit a research-intensive scholar whose expertise will contribute to the development of the Lab and its research output.

Upgrade NSU-CBR website

- Update and upgrade the website for the the NSU Center for Business Research (NSU-CBR).

Database development

- Build, maintain, and be a source for highly reliable databases for our research community.

Research software capability development

- Subscribe and maintain high quality research and analytical software for our researchers.

Collaboration

- Develop collaborative relationships with applied-researchers from the industry and research centers, and secure funding for research projects.

Seminars and workshops

- Organize regular research workshops and seminars series to enhance our collective research capabilities and foster a culture of academic and research excellence among our faculty members.

NSU-UWA Agribusiness Centre of Excellence (ACE)

Overall objective

Sustainable development of agriculture and agribusiness through capacity development, and research and technology transfer for enhanced food security.

Specific objectives of the ACE

- To develop capacity along the Agricultural Value Chain in Bangladesh and in her neighbourhood regions.
- To undertake innovation and adoption research, including use of biotechnology and climate smart agriculture for increased crop and livestock productivity.
- To work directly with industry to ensure that the research conducted within the ACE has relevance to the industry.
- To develop evidence-based agriculture and food policy briefs and disseminate best practices through agribusiness capacity building programs of the ACE and key partners.
- To improve the performance of agriculture and food industry value chains through promoting best application of science and innovation techniques.

Strategies

- Conduct research to identify Challenges and Recommend for Advancing Agribusiness
- Undertake programs for Agribusiness Capacity Building (Teaching, Training and Research)
- Advance Partnership Building (Governments, Industries & Academic Organisations)

Implementation of strategies

- Develop and undertake programs that enhance relevant policy development and productivity improvement.
- Focus on local and regional skilled workforce development and policy requirements.
- Provide short-term professional development courses to managers.
- Undertake internship and fellowship programs.
- Setting up agribusiness knowledge centre to disseminate appropriate research and development information.

School of Engineering and Physical Sciences

Strategic Research Plan 2024-2028



NORTH SOUTH UNIVERSITY
School of Engineering and Physical Sciences

School of Engineering and Physical Sciences (SEPS)

Strategic Research Plan 2024-2028

About the School

The School of Engineering and Physical Sciences (SEPS) has been a school of NSU since its inception. The growth of SEPS parallels with NSU's rise to the top. SEPS, the second largest and fastest growing school at NSU, provides knowledge and skill-based learning environment to its students in the fields of engineering, architecture and physical sciences. The school originally started its journey in 1993 as "School of Engineering and Applied Sciences (SEAS)". Later, the SEAS renamed as School of Engineering and Physical Sciences (SEPS) in 2014. At present, SEPS is the home of over 8000 undergraduate and graduate students in its eight academic programs offered by four academic departments: Department of Architecture, Department of Civil and Environmental Engineering (CEE), Department of Electrical and Computer Engineering (ECE) and the Department of Mathematics and Physics (DMP). All the engineering programs under SEPS are accredited by the Board of Accreditation for Engineering and Technical Education (BAETE) and the Architecture program is accredited by the Accreditation Standard of the Institute of Architects (ASIAB).

The strength of the school grounded not only in the transmission of ideas and knowledge through quality teaching, but also in the cutting-edge research and scholarly achievements of our faculty members. Forty-five of our full-time faculty members are Ph.D. s from North America, Australia or Western Europe and eastern Asia. The breadth of expertise of our faculty members covers almost the entire range of cutting-edge research in engineering, computing, architecture, mathematics and physical sciences. The SEPS also encourage the Interdisciplinary research to address critical and unique challenges facing by the society.

Our faculty members are active in developing new ideas and results exploring the latest knowledge of STEM with modern computation skills profound to solve problems in the engineering and computational sciences, architecture, physical and biological sciences, economics and business.

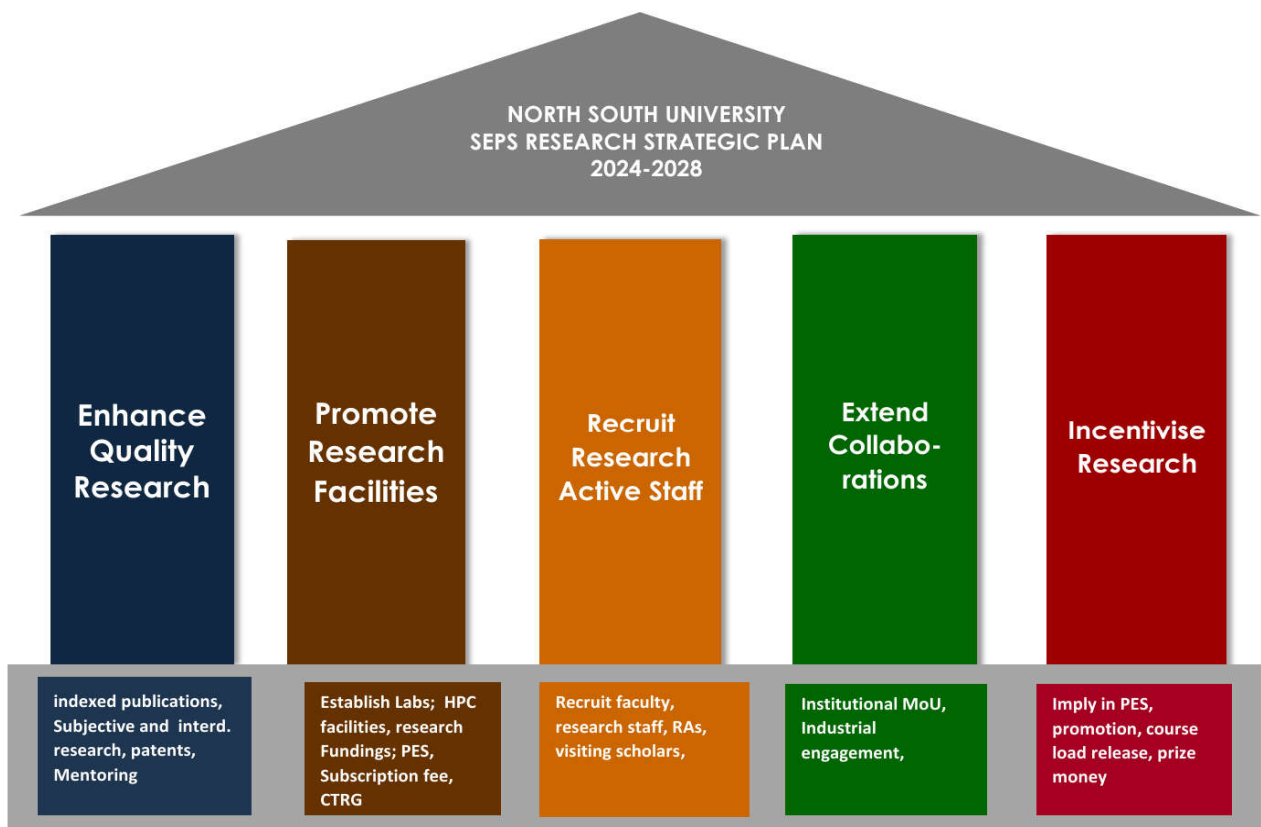
SEPS Vision

The School of Engineering & Physical Sciences (SEPS) intends to be a center of excellence in innovation and technological entrepreneurship by building a knowledge and skill-based learning environment for students in the field of engineering, architecture, and physical sciences with adequate technical competency, social responsibility, communication skill, and ethical standard.

SEPS Mission

Our missions are

- M1.** To maintain international standards in terms of program curricula, instruction style, laboratory and research facilities, faculty recruitment, and student intake.
- M2.** To provide quality teaching and learning in engineering education that would emphasize more on innovation and creativity other than classroom teaching, along with better communication skills.
- M3.** To enhance quality research emphasizing on the greater engagement of practical-oriented study, industry relations, collaboration with reputed universities and research institutes worldwide, etc.
- M4.** To produce technically competent and socially responsible engineering graduates with highest ethical standards and human values, so that they can serve the society holistically.
- M5.** To gain national and global recognition, it will seek various accreditation and certification as required.



SEPS Strategic Research Plan 2024-2028

SEPS Institutes and Centers

Existing Center(s)/ Institute(s)

Center for Infrastructure Research and Services (CIRS).

Center for Applied and Computational Science (CACCS).

Planned Center(s)/ Institute(s)

SEPS plans to establish the following institutes and centers:

Institute of Technological Innovation (ITI)	Timeline: by 2026
Institute for Artificial Intelligence.	Timeline: 2027-2028

Institute of Technological Innovation (ITI)

The objective of the proposed ITI is aimed at creating a hub for industry – academia collaborations and support for innovation, interdisciplinary research, technology transfer, training on cutting edge technologies and business start-up activities by university students and area entrepreneurs, especially for various fields of engineering and technology. The institute will focus on experiential learning through projects, research, training and experimenting innovative ideas primarily for NSU students who are interested in applied research, invention, early stage startups, and entrepreneurship. Its planned scope of activities include: Interdisciplinary Research and Project Grants, Scholarships, Technology Transfer, Seminar and Workshops, Business Skill Development, Technology Skill Development, Business Incubator or Start-up Incubation, Capstone Design Projects, Competitions, Establishment of Research and Project Labs, etc.

SEPS Research Mission

SEPS research missions are-

- The School of Engineering and Physical Sciences (SEPS) at North South University aims to be the center of excellence in innovation, technology, and entrepreneurship through cutting-edge research in the field of engineering, computing, architecture and physical sciences.
- The school aims at working in line with Bangladesh’s national research strategy and fostering the achievement of national, regional, and global sustainable development goals.
- In order to achieve these goals, the school will pursue interdisciplinary research to find out practical, economical, and sustainable solutions of the society’s critical and unique challenges.
- SEPS will also foster inter-institutional and international cooperative and collaborative research opportunities, spur local science and technology innovation through international research collaboration, and promote and disseminate research outcomes benefitting the national, regional, and global community.

- The school will continue working on enhancing capacity building in research by developing field-specific research groups and centers, as well as university-wide research institutes.

Research Priorities:

With a vision to foster achievement of national, regional, and global sustainable development goals, North South University aspires-

- Cutting-edge research in engineering, computing, architecture, and physical sciences, especially in the fields of machine learning and data science, artificial intelligence (AI), robotics, communication and signal processing, cyber securities, advanced transportation, urban heritage & planning, biomedical physics, CFD, and computational and applied mathematics.
- Interdisciplinary research to address critical and unique challenges of the society, such as Waste materials in concrete production, Biomedical Engineering, high performance computing (HPC), etc.
- Extend collaboration among SEPS researchers beyond internal inter- and intra-departmental partnerships to include both local and international individuals as well as public and private agencies, such as MOUs with local and international universities and NGOs.
- Promote and disseminate research outcomes through peer-reviewed indexed journal publications and conference presentations for the benefit of the national, regional, and global community.

SEPS Research Facilities

SEPS Current Research Facilities:

- A High-Performance Computing (HPC) Facility.
- Center for Applied and Computational Science (CACCS).
- Center for Infrastructure Research and Services (CIRS).
- 35 research groups.
- Apurba-NSU R&D Lab (Machine Learning & AI).
- Cyber-Physical System Lab.
- Design Inclusion and Access Lab.
- Mobile Application and Game Testing Lab.
- Optics Lab.
- Machine Intelligence Lab.
- Intelligent Robotics Lab.

- Building Research Lab.
- Architectural Model Making Workshop.
- Civil Engineering Design and Computing Lab.

Planned Research Facilities:

- Institute for Artificial Intelligence.
- Higher Performance Computing (HPC) Facility (2nd Unit).
- Urban Heritage and Planning Research Lab (Architecture)
- Energy and Systems Lab (Architecture)
- Fabrication lab (Architecture)

SEPS Research Strategy (2024-2028)

The core activities of SEPS research are performed by its four academic departments, namely, the Department of Electrical and Computer Engineering (ECE), the Department of Civil and Environmental Engineering (CEE), the Department of Mathematics and Physics (DMP), and the Department of Architecture. The core research areas are broadly categorized as Engineering, Technology, Architecture and Physical Sciences (Computer, Mathematics and Physics).

- **Enhance Quality Research:**
Place a priority on interdisciplinary research that creates synergies among the expertise existing across the School while also building bridges to complementary research expertise elsewhere;
- **Promote Research Facilities**
Consolidate, integrate, and strategically expand the current research projects, and develop new facilities for state-of-art research across the school. This strategy includes establishing new research lab and research centers; facilitate high performance computing, internal and external research grants hunting, providing journal subscription fees and conference travel grants, etc.
- **Recruit Research Active Staff**
Recruit the most talented research active faculty and graduate research assistants to contribute diverse and complementary abilities to the work of our School. This strategy includes research-active faculty recruitment, full-time graduate research assistant appointment, engage research active scholars at various academic programs, hire visiting research scholars for short-term period, etc.

- **Extend Collaborations**

Enhance mechanisms and channels for academic and industrial communication and collaboration. This strategy might include course planning in curricula, industry-based research, internship, invitation of guest lectures, industry visit,

- **Incentivise Research**

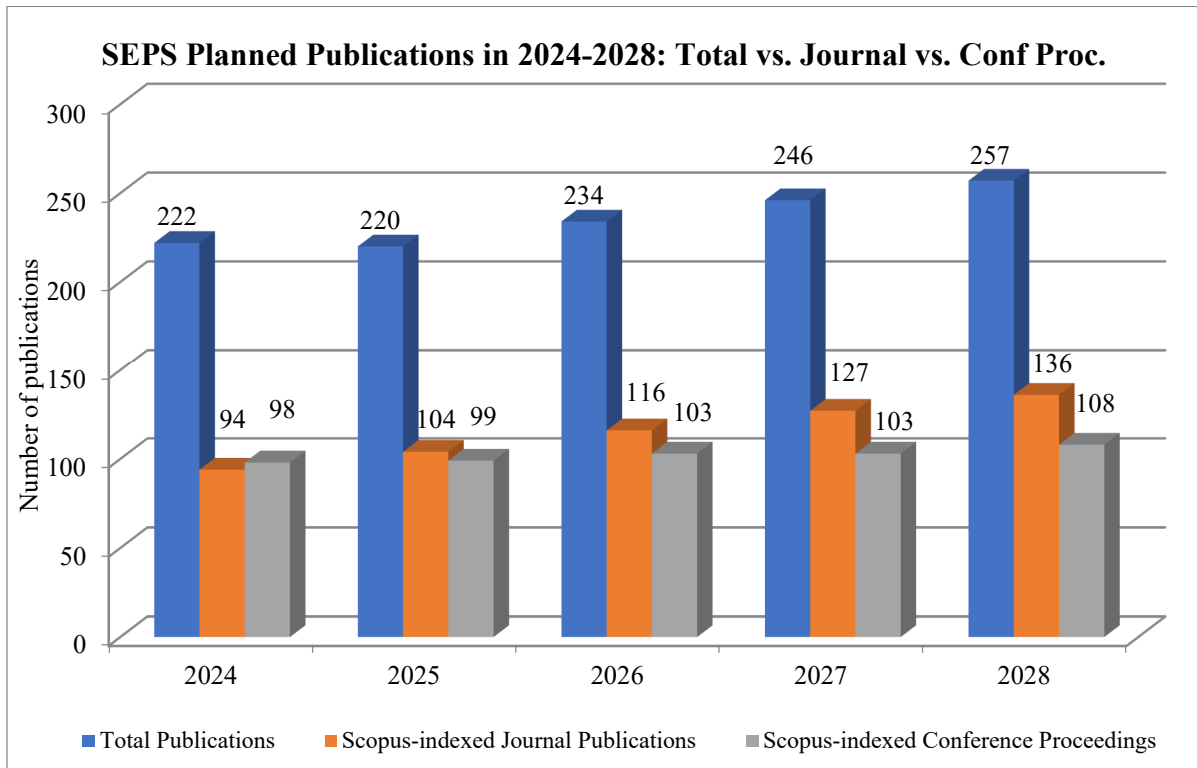
Recognize and reward achievement across all aspects of the research work of the School and maximize opportunities as recognition of disciplinary and/or inter-disciplinary research contributions from faculty, staff, and students. This strategy includes monetary and non-monetary incentives, such as special increment(s), prize money, course load release, benefit in academic promotion and additional credit in faculty performance evaluation system, etc.

Planned Research Activities of SEPS

Type / Year	2024	2025	2026	2027	2028
Total Peer-reviewed Journal/Conference Article Publications	222	220	234	246	257
Scopus-indexed Journal /Conference Article Publications	189	198	213	225	239
Scopus-indexed Journal Article Publications	94	104	116	127	136
Scopus-indexed Conference Proceedings Article Publications	98	99	103	103	108
Books	6	4	2	3	3
Book Chapters	9	11	13	13	19
Edited Books	1	2	2	1	2
Edited Volumes	0	0	0	0	0
Business Cases / Case Studies	1	3	2	2	2
Conference Presentations by faculty members	26	26	29	31	31
Department's / School's own Conference Proceedings	0	1	1	3	1
Working Papers/ Presentations by faculty members	7	6	6	8	6
Department's / School's own Symposium	0	3	2	4	3
Inter-institutional research collaborations with local and foreign universities	18	18	21	21	27
NSU Research Grants (Million BDT)	16.5	16.5	19	19.5	24
Extramural research grants (Million BDT)	2	4.2	1.5	4.5	3

Establishment of new research labs or centers	4	3	2	3	6
Establishment of new research institutes	0	1	1	3	2
Others (Research workshop/ seminar/ conference)	16	26	27	29	29
Project reports by faculty members (national-level)	1	2	0	2	0
Project reports by faculty members (International-level)	0	0	1	1	2

SEPS Journal /Conference Article Publications Target: 2024-2028



Planned Research Activities (2024-2028)

Department of Electrical and Computer Engineering

Type / Year	2024	2025	2026	2027	2028
Total Peer-reviewed Journal/Conference Article Publications	113	119	129	136	145
Scopus-indexed Journal /Conference Article Publications	110	116	125	132	140
Scopus-indexed Journal Article Publications	40	44	48	55	58
Scopus-indexed Conference Proceedings Article Publications	70	72	77	77	82
Book Chapters	3	3	4	4	5
Department's / School's own Symposium		1		1	
Inter-institutional research collaborations with local and foreign universities	3	4	5	5	6
NSU Research Grants (Million BDT)	8	8	10	10	12
Establishment of new research labs or centers	2	2	0	1	1
Establishment of new research institutes		1			
Others (Research workshop/ seminar/ conference)	2	2	2	2	2

Department of Civil and Environmental Engineering

Type / Year	2024	2024	2026	2027	2028
Total Peer-reviewed Journal/Conference Article Publications	33	33	33	35	36
Scopus-indexed Journal /Conference Article Publications	17	20	20	25	25
Scopus-indexed Journal Article Publications	10	12	13	14	15
Scopus-indexed Conference Proceedings Article Publications	6	8	8	9	10
Books	1	1	1	2	1
Book Chapters	4	4	4	5	5
Edited Books	1	1	1	1	1
Business Cases / Case Studies	1	1	1	1	1
Conference Presentations by faculty members	19	19	20	20	20

Working Papers/ Presentations by faculty members	5	5	6	6	6
Department's / School's own Symposium	0	0	1	1	1
Inter-institutional research collaborations with local and foreign universities	0	1	0	1	1
NSU Research Grants (Million BDT)	1.5	1.5	1.5	1.5	1.5
Extramural research grants (Million BDT)	0	3	0	3	0
Establishment of new research labs or centers	1	0	1	0	1
Establishment of new research institutes	0	0	0	1	0
Others (Research workshop/ seminar/ conference)	10	10	10	10	10
Project reports by faculty members (national-level)	0	1	0	1	0
Project reports by faculty members (International-level)	0	0	1	1	1

Department of Architecture

Type / Year	2024	2025	2026	2027	2028
Total Peer-reviewed Journal/Conference Article Publications	16	3	2	3	1
Scopus-indexed Journal /Conference Article Publications	7	2	3	1	2
Scopus-indexed Journal Article Publications	4	3	3	3	3
Scopus-indexed Conference Proceedings Article Publications	7	4	5	4	4
Books	5	3		0	0
Book Chapters	0	1	1	0	4
Edited Books	0	1	1	0	1
Business Cases / Case Studies	0	2	1	1	1
Conference Presentations by faculty members	7	0	1	1	1
Department's / School's own Conference Proceedings	0	1	1	2	0
Working Papers/ Presentations by faculty members	2	1	0	2	0
Department's / School's own Symposium	0	1	0	1	0
Inter-institutional research collaborations with local and foreign universities	3	1	1	0	0

NSU Research Grants (Million BDT)	1.5	1	1	1	3
Extramural research grants (Million BDT)	1	0	0	0	1
Establishment of new research labs or centers	0	1	1	0	2
Establishment of new research institutes	0	0	1	1	1
Others (Research workshop/ seminar/ conference)	4	2	3	2	2
Project reports by faculty members (national-level)	1	1	0	1	0
Project reports by faculty members (International-level)	0	0	0	0	1

Department of Mathematics and Physics

Type / Year	2024	2025	2026	2027	2028
Total Peer-reviewed Journal/Conference Article Publications	60	65	70	72	75
Scopus-indexed Journal /Conference Article Publications	55	60	65	67	72
Scopus-indexed Journal Article Publications	40	45	52	55	60
Scopus-indexed Conference Proceedings Article Publications	15	15	13	13	12
Books	0	0	1	1	2
Book Chapters	2	3	4	4	5
Business Cases / Case Studies	5				
Conference Presentations by faculty members	5	7	8	10	10
Department's / School's own Conference Proceedings	0	0	0	1	1
Department's / School's own Symposium	0	1	1	1	2
Inter-institutional research collaborations with local and foreign universities	12	12	15	15	20
NSU Research Grants (Million BDT)	5.5	6	6.5	7	7.5
Extramural research grants (Million BDT)	1	1.2	1.5	1.5	2
Establishment of new research labs or centers	1	0	0	2	2
Establishment of new research institutes	0	0	0	1	1
Others (Research workshop/ seminar/ conference)	10	12	12	15	15

SEPS Research Groups

In the school of Engineering and Physical Sciences (SEPS), currently as of October 2019, there are twenty-five (25) formal or informal research groups. The faculty members have been working on the different research fields with the existing facilities. According to their requirements, if NSU supports these and future research groups' ongoing and future works, SEPS will be able to meet its five years research goals and targets. The detailed information follows.

Note:

DA = Department of Architecture,

DCEE = Department of Civil and Environmental Engineering,

ECE = Department of Electrical and Computer Engineering

DMP = Department of Mathematics and Physics.

SEPS Dept.	Gr. ID	Name of Group / Center (existing or tentative)	Group Status (Formal or Informal)	Related Faculty Members (Name, Position, Department)	Prioritized Field(s) of Work (list in order of engagement)	Software being used or needed for the group	Expected/ Typical Outcomes (model, paper, report, training, etc.)	Yearly Outcome Targets	Remarks
DA	DA-01	Building Technology & Material Research Lab (BTMRL)	Informal	1. Mujtaba Ahsan, Associate Professor, DA 2. Shahriar Iqbal Raj, Assistant Professor, DA 3. Maruf Hossain, Assistant Professor, DA	1. Sustainable Architecture; 2. Energy Efficiency in Buildings; 3. Water Efficiency in Buildings; 4. Occupant Health and Safety in Buildings: (a) Building Fire Safety (b) Indoor Environmental Quality; 5. Urban Heat Island Effect.	1. IESVE (Licence Expired); 2. Energy Plus (free); 3. Vidual DOE (License purchased).	Paper, Report and Training	2 Papers; 2 Reports; and 1 Training Manual	Need a lab assistant to look after equipment requisition and maintenance
DA	DA-02	Urban Heritage & Planning Research Lab	Informal	1. Dr. Nandini Awal, Associate Professor, DA2. 2. Mehnaj Tabassum, Lecturer, DA2 3. AKM Saleh Ahmed Anik DA2	1. Documentation of Urban Heritage Building 2. Existing Drawing Archiving	1. Leica 3D scanner RTC360 for outdoor and indoor scanning 2. Leica 3D scanner BLK2 G0-3631249	1. Journal paper, Conference paper, research report, and training	1. Journal Paper 2. Conference Presentation and proceedings	1. High Performance Camera 2. 3D scanner 3. High Performance Drone 4. Research space & RA facilities
DA	DA-03	Building Energy & Systems Lab	Informal	1. Dr. Saiful Islam, Professor, DA3. 2. Mr. Rishaad Mohammad Yusuff, DA3 Lecturer	1. Heat stress mapping and mitigation. 2. Passive cooling. 3. Thermal comfort. 4. daylight	1. EnergyPlus 2. Ecotect 3. Fluent 4. Honeybee	1. Journal paper, Conference paper, research report, and training	1. Journal Paper 2. Conference Presentation and proceedings	1. Weather station. 2. Surface temperature gauge 3. DBT, RH data logger. 4. Lux meters

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DCEE	CEE-01	Advanced Transportation Research Group	Informal	1. Javed Bari, Professor, CEE, NSU; 2. Kazi Md Shifun Newaz, Assistant Professor, ARI (Accident Research Institute), BUET	1. Road Safety; 2. Transport Planning and Management.	1. MAAP-V; 2. ViDA (iRAP software); 3. AASHTO Roadway Capacity software.	Journal paper, Conference paper, research report, and training	1 Journal paper, 1 Conference paper, 2 research reports, and 1 training	Need: (a) High performance computing facility (3 computers); and (b) Room and sitting arrangement for 4 – 6 research assistants.
DCEE	CEE-02	Advanced Pavement Research Group	Informal	1. Javed Bari, Professor, CEE, NSU; 2. Dr. Abdullah Al Mamun, Director of BRRL & Superintending Engineer of RHD.	1. Pavement materials characterization; 2. Road design and management.	1. AASHTO MEPDG and various pavement design software; 2. HDM-IV software of the World Bank.	Journal paper, Conference paper, research report, and training	1 Journal paper, 1 Conference paper, 2 research reports, and 1 training	Need: (a) DSR, RTFO and PAV in Lab; (b) High performance computing facility (2 computers); (c) Room and sitting arrangement for 6 research assistants
DCEE	CEE-03	-	Informal	Professor Mohammad Nazmul Islam	Nano beam, Nano plates	Mathematica	Journal papers, conference proceedings	2 journal papers 1 conference proceedings	-

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DCEE	CEE-04	Environmental Geochemistry and Health	Informal	Dr. Shama E. Haque, Associate Professor, DCEE Dr Nazmun Nahar, Professor, DCEE	1. Environmental geochemistry; 2. Environmental and Public Health	GIS, GPS	Journal Articles; Conference Proceedings; Seminars	1 of each	On-going
DCEE	CEE-05	Geo Environmental Engineering Group	Informal	Dr. Shama E. Haque, Assoc. Prof., DCEE Dr Minhaz Mohammad Shahriar, Asst. Prof., DCEE Dr Nazmun Nahar, Professor, DCEE	1. Environmental Geochemistry; 2. Geotechnical Engineering	GIS, GPS	Journal Articles; Conference Proceedings; Seminars	1 of each	On-going
		Waste materials in concrete production.	Informal	Dr. S M Ashfaul Hoq	Experimental research work involving test specimen and full-scale beam.	-	Journal papers and conference proceedings.	1 journal paper and 2 conference proceedings.	

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ECE	ECE-01	Communication and Signal processing	Informal	Dr. M A Matin, Professor, ECE, Dr. Mohammad Monirujjaman Khan, Associate Professor, ECE Dr. Riasat Khan, Associate Professor, ECE	1. Distributed wireless access, scheduling, and power control 2. MIMO-OFDM 3. Network coding 4. Wideband, multiband and smart antennas for wireless applications 5. Spectrum sensing techniques, power and admission control 6. Sensor applications IoT	CST Microwave Studio	Research articles	2 book chapters, 2 Journal articles, 4 conference proceedings	With few Master's degree students
ECE	ECE-02	NSU Optics, Machine Learning and Biomedical Research Group	Formal (it consists more than 20 students and few paid research assistants)	Dr. Mahdy Rahman Chowdhury, Associate Professor, ECE Ms. Syeda Sarita Hassan, Lecturer, ECE	1. Optics and Photonics; 2. Biomedical Disease Detection Technique; 3. Application of Machine Learning; 4. Computational Economics.	COMSOL Multyphysics; Lumerical FDTD; WEKA; RapidMiner Studio; Python; Rhino.	Several High Impact Factor top quality international Journals and Commercially available early disease detection software.	(1) At least Five top quality international Q1 High Impact Factor Journals (2) Winning of external (& internal) Research grants	This group is regularly publishing some high-quality international journals like some in Nature Publishing Group.

SEPS Dept.	Gr. ID	Name of Group / Center (existing or tentative)	Group Status (Formal or Informal)	Related Faculty Members (Name, Position, Department)	Prioritized Field(s) of Work (list in order of engagement)	Software being used or needed for the group	Expected/ Typical Outcomes (model, paper, report, training, etc.)	Yearly Outcome Targets	Remarks
ECE	ECE-03	NSU Intelligent Robotics (NIRO) Lab	Formal	1. Dr. Shahnewaz Siddique, Asso. Professor, ECE; 2. Dr. Lamia Iftekhar, Asso. Professor 3. Dr. Shahriar Karim, Asso. Prof.; 4. Dr. Riasat Khan, Asso. Prof.; 5. Dr. M A Qayum, Assis. Prof.;	1. Robotics 2. Deep learning	Python Matlab Tensorflow Pytorch	Research articles Robot AI demos	Submit papers for review	
ECE	ECE-04	OBE Management System	Informal	1. Dr. Ahsanur Rahman, Asso. Professor, ECE 2. Dr. Riasat Khan, Asso. Professor, ECE	1. Outcome-based Education (OBE) 2. AI	PHP Laravel Javascript	Software application & publications	1 paper	System development is the target primarily
ECE	ECE-05	ML and Computer Vision Lab		Dr. Shafin Rahman Dr. Nabeel Mohammed Dr. Sifat Momen Mr. Mirza Mohammad Lutfi Elahi Dr. Mohammad Shifat E Rabbi	Machine Learning Computer Vision Language and Vision	Linux machines with NVIDIA GPUs	Research articles, trained model	1 conference paper, 1 journal paper	

SEPS Dept.	Gr. ID	Name of Group / Center (existing or tentative)	Group Status (Formal or Informal)	Related Faculty Members (Name, Position, Department)	Prioritized Field(s) of Work (list in order of engagement)	Software being used or needed for the group	Expected/ Typical Outcomes (model, paper, report, training, etc.)	Yearly Outcome Targets	Remarks
ECE	ECE-06	Remotely Accessible Cyber-Physical System Testbed and Open Architecture Synchrophasor Systems for Bangladesh's National Power Grid's Cyber Security and Reliability	Formal (Energy and Power Research Council) Project	1. Dr. Hafiz Abdur Rahman, Professor, ECE; 2. Dr. Jahangir Hossain, The University of British Columbia; 3. Dr. Athula Kulatunga, Purdue University Northwest 4. Dr. Shohana Rahman Deeba, ECE	Power and Energy Systems	MATLAB PSAT	Synchrophasor and SCADA Prototype	1 conference paper 1 journal paper	
ECE	ECE-07	Machine Learning Lab	Informal	1. Dr. Sifat Momen, Asso. Professor, ECE 2. Dr. Shafin Rahman, Asst. Professor, ECE 3. Dr. Nabeel Mohammed, , Asso. Professor, ECE 4. Dr. Riasat Khan, Asso. Professor, ECE	(1)Applied Machine Learning and Data Science (2)Extracting actionable insights from data	Anaconda, Weka, Netlogo, Tensorflow, Pytorch I would need a Linux machine with GPUs. This would facilitate carrying out computational	Research Papers and collaboration. Publications: 1 journal article and 4 conference papers (2014) so far, 4 journal articles and 5 conference papers (2013)	1 journal article and 1 conference paper	

SEPS Dept.	Gr. ID	Name of Group / Center (existing or tentative)	Group Status (Formal or Informal)	Related Faculty Members (Name, Position, Department)	Prioritized Field(s) of Work (list in order of engagement)	Software being used or needed for the group	Expected/ Typical Outcomes (model, paper, report, training, etc.)	Yearly Outcome Targets	Remarks
				5. Ms. Silvia Ahmed, Sr Lecturer, ECE 6. Mr. Shawmoon Azad (RA) 7. Mr. Shakirul Islam Leon (RA)		ly expensive tasks.	Collaboration: Research collaboration with the University of Sheffield, UK (last year). Funding received (current): (1) BDT 5 Lac (CTRG) as PI, (2) BDT 4.80 Lac (CTRG) as Co-PI		
ECE	ECE-08	Apurba-NSU R&D Lab	Formal	1. Dr. Nabeel Mohammed, , Asso. Professor, ECE 2. Dr. Shafin Rahman, Asst. Professor, ECE 3. Dr. Fuad Rahman (Apurba Technologies) 4. Ismail Hossain (RA)	Natural Language Processing, Computer Vision, Data Science, Biomedical Engineering Doing Machine Learning/Deep Learning R&D that aligns with	Linux machines with NVIDIA GPUs.	Current Outcomes: Publications: 1 journal paper and 2 conference papers (9 papers in total since creation of lab)	For this year the target is to submit another 1 paper for review	Need to establish a physical lab where RAs can come and work. Currently RAs have to work remotely.

SEPS Dept.	Gr. ID	Name of Group / Center (existing or tentative)	Group Status (Formal or Informal)	Related Faculty Members (Name, Position, Department)	Prioritized Field(s) of Work (list in order of engagement)	Software being used or needed for the group	Expected/ Typical Outcomes (model, paper, report, training, etc.)	Yearly Outcome Targets	Remarks
				5. Tabassum Sahjahan (RA) 6. Kazi Rafat Haa Meem (RA)	the goals of the industry partner.		Funding Received: In total TK 63,00,000 (Sixty three lacs) Since October 2020		
ECE	ECE-09	Digital Access and Inclusion Lab	Informal	1. Dr. Nova Ahmed, Professor, ECE Collaborates with Internally (NSU); 2. Dr. Hasan Muhammad Bainamin, NSU; 3. Dr. Abdul Wohab, NSU; 4. Dr. Raihana Sharmin, NSU; 5. Dr. Saidul Islam, NSU; 6. Dr. Ummaha tul Hazra, NSU; 7. Dr. Asad Karim Khan Priyo, NSU	1. HCI, Pervasive Systems, AI, Education	Wearable design using sensors, software for coding and analysis (e.g., Nvivo)	Research and collaboration	One publication per year	

SEPS Dept.	Gr. ID	Name of Group / Center (existing or tentative)	Group Status (Formal or Informal)	Related Faculty Members (Name, Position, Department)	Prioritized Field(s) of Work (list in order of engagement)	Software being used or needed for the group	Expected/ Typical Outcomes (model, paper, report, training, etc.)	Yearly Outcome Targets	Remarks
ECE	ECE-10	AI in Dentistry	Informal	1. Dr. Nabeel Mohammed, Asso. Professor, ECE 2. Mr. Saif Ahmed, part-time faculty member, ECE	Natural Language Processing, Computer Vision, Data Science, Biomedical Engineering	Linux machines with NVIDIA GPUs.	Current outcomes: 4 journal papers in 2023 Ongoing collaboration with the University of Adelaide	Aim to submit 1 paper in 2024	Need to establish a physical lab where RAs can come and work. Currently, RAs have to work remotely.
ECE	ECE-11	Nano-electronics Research Group	Informal (Consists of a few paid RAs and volunteer students/ alumni)	Dr. Nafisa Noor	1. Finite element modeling (FEM) of nanoelectronic memory devices 2. SPICE circuit simulations of micro- and nanoelectronic circuits 3. Molecular dynamics (MD) simulations of materials 4. Automated Measurement & Instrumentation	COMSOL Multiphysics, LTSpice, MATLAB, Quantum Espresso, IBM Qiskit, OriginPro, Illustrator, Sketchup, LabVIEW	Collaborations with faculty members and researchers from the USA, Germany, the Netherlands, and a number of Bangladeshi Universities. Several internal and external grants.	Journal and conference papers	Without a lab space, students can only work on the hardware projects at the faculty member's office. It's very inconvenient to attend office hours with the equipment on that table.

SEPS Dept.	Gr. ID	Name of Group / Center (existing or tentative)	Group Status (Formal or Informal)	Related Faculty Members (Name, Position, Department)	Prioritized Field(s) of Work (list in order of engagement)	Software being used or needed for the group	Expected/ Typical Outcomes (model, paper, report, training, etc.)	Yearly Outcome Targets	Remarks
ECE	ECE-12	ECE Multi-Disciplinary Research Group	Informal	1. Dr. Mohammad Monirujjaman Khan, Asso. Professor, ECE 2. Dr. Monir Uddin, Asso. Professor, DMP 3. Dr. Abul Kalam Azad 4. Dr. Mohammad Khasro Miah, Professor, SBE	Biomedical Engineering, Artificial Intelligence		Research and collaboration	Five publication per year	
DMP	DMP-01	CFD-LAB	informal	1. Md. Mamun Molla, PhD, Professor, DMP (Group leader) 2. Preetom Nag, PhD, 3. Mahboob Shaheen, Senior Lecturer, DMP 4. Md. Zahangir Hossain, Senior Lecturer, DMP	1. Computational Fluid Dynamics (CFD); 2. Heat transfer enhancement and control; 3. Bio-fluid dynamics; 4. High performance parallel computing (HPC); 5. GPU computing	C, C++, CUDA C, Fortran, MATLAB, Tecplot, Fluent, COMSOL, etc.	Journal paper, Conference paper, and Book chapter	1 Journal paper, 4-5 Conference paper, 4-5, Book chapter-1	Need: Urgently we need a Research Lab where we can set up 10-12 desktop computers

SEPS Dept.	Gr. ID	Name of Group / Center (existing or tentative)	Group Status (Formal or Informal)	Related Faculty Members (Name, Position, Department)	Prioritized Field(s) of Work (list in order of engagement)	Software being used or needed for the group	Expected/ Typical Outcomes (model, paper, report, training, etc.)	Yearly Outcome Targets	Remarks
DMP	DMP-02	Control System and Model Reduction	Informal	1. Dr. Mohammad Sahadet Hossain. Professor, Dept. of mathematics and Physics, NSU 2. Dr. Mohammad Monir Uddin, Associate Professor Dept. of mathematics and Physics, NSU	- System and control theory; - Model order reduction of dynamical systems; - Matrix equations and solutions; Numerical Linear Algebra.	MATLAB Python	- Journal paper; - Conference proceedings; - Book Chapters	At least 1 journal paper (scopus indexed), and 2 international conference proceedings (scopus indexed)	The research group is working informally for last 3 years.
DMP	DMP-03	MRI Physics 1	Informal	Dr. Zaid Bin Mahbub, DMP, NSU Dr Asiful Islam, EEE, BUET; Prof Enam, MIST; Dr Enam, Yale University, USA; Prof P Gowland, University of Nottingham, UK	- Quantitative MRI: Bangladesh perspective	-MATLAB -Python	- Graduate research - Journal paper - Conference presentation	- Graduate degree	-
DMP	DMP-04	Biomedical Physics 1	Informal	Dr Harun ur Rashid, Associate Prof. DMP, NSU; Dr. Md. Shariful Islam,	- Study of Molecular Transport: biophysics approach - Nerve microstructure study using conduction	-MATLAB	- Graduate research - Journal paper	- Graduate degree	-

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				Associate Prof. DMP, NSU			- Conference presentation		
DMP	DMP-05	Heat Transfer	informal	1. Preetom Nag, PhD, Associate Prof., DMP 2. Dr. Hasina Akter, Associate Prof., DMP	1. Computational Fluid Dynamics (CFD); 2. Heat transfer enhancement and control; 3. Bio-fluid dynamics; 4. High performance parallel computing (HPC); 5. GPU computing	C, C++, CUDA C, Fortran, MATLAB, Tecplot, Fluent, COMSOL, etc.	Journal paper, Conference paper, and Book chapter	1 Journal paper, 4-5 Conference paper, 4-5, Book chapter-1	Need: Urgently we need a Research Lab where we can set up 10-12 desktop computers
DMP	DMP-06	Research Team of Industrial and Applied Mathematics (RTIAM)	Informal	1. Dr. Mohammad Monir Uddin (Associate Prof. of DMP) 2. Dr. Md. Sahadet Hossain (Prof. of DMP) Dr. Md. Sumon Hossain, Assistant professor, DMP	(1) Computational methods in System and control theory (2) Model order reduction of large-scale dynamical systems (3) Numerical Linear Algebra (4) Scientific Computing (5) Artificial Intelligent and Deep Learning (6) Dynamic Mode Decomposition.	(1) MATLAB (2) PYTHON (3) C	(1) Research paper (2) Industrial collaboration (3) External Research collaboration with home and abroad (4) Training students	At least 3 journal paper (scopus indexed), 3 international conference proceedings (scopus indexed) and 2 Book Chapters	Around 10 research students are working. We need a Room where we can provide our students to work together.

School of Health and Life Sciences

Strategic Research Plan 2024-2028

School of Health and Life Sciences (SHLS) Strategic Research Priorities

North South University (NSU) is the first private university of Bangladesh established in 1992. The School of Health and Life Sciences (SHLS) started its journey in 2006 comprising of four departments: 1) Department of Pharmaceutical Sciences, 2) Department of Public Health, 3) Department of Environmental Sciences and Management, and 4) Department of Microbiology and Biochemistry. The school is also home of two research institutes: the NSU Genome Research Institute (NGRI) and the NSU Global Health Institute (NGHI). Additionally, the school includes the Advanced Bioscience Research Center. Apart from imparting global standard education to its students, the school is committed to conduct high-quality cutting-edge research to contribute to the national and global evidence-based policies. The school focused on the Sustainable Development Goals (SDG) in setting its research priorities for the period 2024-2028. The four departments and two research institutes identified the following SDGs for their research priority areas in the next five years.

SDG-1: End poverty in all its forms everywhere

SDG-2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

SDG-3: Ensure healthy lives and promote well-being for all at all ages

SDG-4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

SDG-5: Achieve gender equality and empower all women and girls.

SDG-6: Ensure availability and sustainable management of water and sanitation for all

SDG-7: Ensure access to affordable, reliable, sustainable, and modern energy for all

SDG-8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

SDG-9: Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation

SDG-10: Reduce income inequality within and among economies

SDG-11: Make cities and human settlements inclusive, safe, resilient, and sustainable

SDG-12: Ensure sustainable consumption and production patterns

SDG-13: Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy

SDG-14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

SDG-15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

SDG-16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels

SDG-17: Strengthen the means of implementation and revitalize the global partnership for sustainable development

Department of Pharmaceutical Sciences

A. Summary of Research Priorities

Research Area	SDG alignment
Research Area I: Neurobiology & Behavioral Neuroscience	SDG 3
Research Area II: Bioinformatics & AI in drug discovery	SDG 3 and 9
Research Area III: Gene Expression & Cellular Biology	SDG 3 and 9
Research Area IV: Pharmacology & Toxicology	SDG 3 and 9
Research Area V: Pharmaceutical Analysis	SDG 3 and 9
Research Area VI: Bioequivalence Studies & Clinical Trials	SDG 3
Research Area VII: Nanotechnology & Drug Delivery System	SDG 3 and 9
Research Area VIII: Redox Biology	SDG 3 and 9
Research Area IX: Microbiology & Biotechnology	SDG 3 and 9
Research Area X: Survey-based Studies	SDG 3

B. Details of Research Priorities

Research Area I: Neurobiology & Behavioral Neuroscience	
Priorities	<p>1.1 Neuropathology & Immune interaction: To study the role of diverse neuronal signaling and its crosstalk with the immune counterpart in neuropathological conditions such as Stroke.</p> <p>1.2 Neurodevelopmental disorders: To screen and evaluate the role of candidate drug molecule and its associated molecular mechanism in animal models of developmental disorders such as Autism Spectrum Disorders (ASD)</p> <p>1.3 Neurodegenerative disorders: To understand and assess the basis of memory function and muscular disorders such as Parkinsons Disease in mouse models.</p> <p>1.4 Behavioural neuroscience: Memory and learning</p>
Expected outcomes	<ul style="list-style-type: none"> • The establishment of neuroscience laboratories will be facilitated. • Graduate students will benefit while applying for a PhD in the relevant discipline. • A substantial number of journal articles will be published in SCOPUS-

	<p>indexed scientific journals.</p> <ul style="list-style-type: none"> • Boost collaboration at home and abroad.
Strategies to achieve the goals	<ul style="list-style-type: none"> • To apply for research funds. • Encourage collaboration both within and between universities.

Research Area II: Bioinformatics & AI in drug discovery	
Priorities	<p>2.1 In silico discovery and characterization of drug targets and candidate drug molecules.</p> <p>2.2 Analysis of drug interactions through chemical, genomic, and proteomic data Computational drug discovery</p> <p>2.3 Use of machine learning and artificial intelligence in health sciences</p>
Expected outcomes	<ul style="list-style-type: none"> • Introduction of new therapeutic candidates for preclinical and clinical studies. • Improved characterization of novel and promising therapeutics. • Establishment of a computational drug discovery laboratory. • International SCOPUS indexed publications.
Strategies to achieve the goals	<ul style="list-style-type: none"> • To apply for a research grant to increase the number of workstation computers. • To establish collaboration with national and international organizations.

Research Area III: Gene expression & Cellular Biology	
Priorities	<p>3.1 Pharmacogenomics</p> <p>3.2 Identification of susceptible genetic and blood-based biomarkers associated with obesity.</p> <p>3.3 Assessment of blood-based genetic markers linked to smoking and addiction.</p> <p>3.4 Clinical and epidemiological study on breast cancer and cervical cancer.</p>
Expected outcomes	<ul style="list-style-type: none"> • The findings of the study could potentially aid in limiting the rise of cancer • The findings of the study may also aid in raising awareness of the health hazards associated with obesity and tobacco addiction. • Help identify and commercialize novel biomarkers to control obesity and cancer. • Establishment of molecular and mammalian cell culture facility • International/National Publications.

Strategies to achieve the goals	<ul style="list-style-type: none"> • Applying for funds from national and international bodies • Use of existing laboratory facilities to test and analyze results. • To establish collaboration with national and international research institutes.
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Research Area IV: Pharmacology & Toxicology

Priorities	<p>4.1 Development of an animal models of atherosclerosis, diabetes, hypertension, and dyslipidemia as implications of the metabolic syndrome.</p> <p>4.2 Evaluation of the effects of phytochemicals on metabolic syndrome-related complications through in vitro, in vivo, and in-silico studies.</p> <p>4.3 Exploring the molecular mechanism of action of phytochemicals on metabolic complications</p> <p>4.4 Pharmacological effects of medicinal plants / alternative medicines and their formulations in hepatorenal toxicity.</p> <p>4.5 Development of an animal models of inflammatory and autoimmune disorders</p>
Expected outcomes	<ul style="list-style-type: none"> • To facilitate the study of cardiovascular and renal complications • To Promote the use of nutraceuticals for cardiovascular, renal, and hepatic complications • Provide insight into understanding the toxic effect of phytochemicals, if any. • Capacity development for Pharmacology laboratory facilities • The research results will be published in SCOPUS-indexed journals.
Strategies to achieve the goals	<ul style="list-style-type: none"> • To apply for the research grant. • To establish collaboration with national and international organizations. • Use of existing laboratory facilities to test and analyze results.

Research Area V: Pharmaceutical Analysis

Priorities	<p>5.1 Analytical HPLC, including quantification of biomolecules, pharmacoequivalence, and potency assay</p> <p>5.2 Qualitative and quantitative analysis of compounds in the plant extract and other samples.</p> <p>5.3 The Introduction of GC-MS in analyzing volatile compounds and terpenoids from medicinal plants.</p> <p>5.4 Method developments for simultaneous detection of pharmaceutical ingredients in a mixture.</p> <p>5.5 Method development for HPLC and LC-MS</p> <p>5.6 Design, synthesis, isolation, purification, and detection of Organic Drug Compounds</p>
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Expected outcomes	<ul style="list-style-type: none"> • Enhance capacity development for analytical laboratory facilities • Development and characterization of new drug candidates • International SCOPUS-indexed journal publications.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Applying for research funds • Use of existing laboratory facilities and equipment • Participating in the workshop(s) to provide training to laboratory officers to get hands-on experience with the new techniques. • Establishment of international collaboration

Research Area VI: Bioequivalence Studies & Clinical Trials

Priorities	<p>6.1 To establish a Clinical Research Organization (CRO)</p> <p>6.2 To introduce clinical trials in collaboration with national and international organizations</p>
Expected outcomes	<ul style="list-style-type: none"> • Commercialization of the bioequivalence facilities where pharmaceutical industries will be benefited • Dissemination of the clinical trial findings through international journal publications
Strategies to achieve the goals	<ul style="list-style-type: none"> • Establishment of Academia-Pharmaceutical industry collaboration • Encouragement of Pharmaceutical Industries to provide funds for such studies • Training research students/laboratory officers/ faculty

Research Area VII: Nanotechnology & Drug Delivery System

Priorities	<p>7.1 Development of nano drug delivery systems for BCS class II and IV groups of drugs</p> <p>7.2 Nano and advanced targeted drug delivery systems to treat cancer, CNS, metabolic and other disorders.</p> <p>7.3 Nano carrier-based systems for enhanced drug delivery, diagnostic, and/or therapeutic purpose</p> <p>7.4 Design and evaluation of modified-release dosage forms</p> <p>7.5 Design of experiments to improve the quality of pharmaceutical dosage forms.</p>
Expected outcomes	<ul style="list-style-type: none"> • Improved pharmaceutical dosage forms • International SCOPUS indexed publications.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Apply for research funds. • Establishment of collaboration • Use of existing laboratory facility

Research Area VIII: Redox Biology	
Priorities	8.1 Mitochondrial respiration (Electron transport chain activity) assessment and reactive oxygen species (ROS generation) analysis. 8.2 - In-vitro and in-vivo models for the study of redox reactions in biological samples.
Expected outcomes	<ul style="list-style-type: none"> • International SCOPUS-indexed journal publications.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Apply for research funds. • Establishment of collaboration • Use of existing laboratory facility

Research Area IX: Microbiology & Biotechnology	
Priorities	9.1 To set up the mammalian cell culture facility and molecular biology laboratory 9.2 Antimicrobial Drug Resistance 9.3 Antimicrobial properties of plants and natural products against pathogenic bacteria 9.4 Determination of microbial limit of pharmaceuticals and natural products 9.5 Microbial fermentation for the production of pharmaceuticals
Expected outcomes	<ul style="list-style-type: none"> • Understanding of drug resistance and action plans for eventual prevention. • Development of new antimicrobials from plants and natural sources. • Production of biopharmaceuticals through microbial fermentation processes. • Drug development from natural fermentation products. • International SCOPUS-indexed journal publications.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Apply for research funds. • Establishment of collaboration • Use of existing laboratory facility

Research Area X: Survey-based Studies	
Priorities	10.1 Survey on pharmacy practice and knowledge-related areas 10.2 Environmental pharmacy and drug disposal practices 10.3 Pharmaceutical marketing and public health
Expected outcomes	<ul style="list-style-type: none"> • International SCOPUS-indexed journal publications. • General Awareness

Strategies to achieve the goals	<ul style="list-style-type: none"> • Apply for research funds. • Establishment of collaboration
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C. Existing Equipment in The Department

Serial	Laboratory Name	Name of Equipment	Unit
1	Organic Pharmacy & Medicinal Chemistry Lab	Refrigerator, Deep Freezer (-20°C)	1
		Hot plate with magnetic stirrer	
		Electric Weight Balance	
		Centrifuge (Sorvall ST 8R temp controlled)	
		Fume Hood	
		Soxhlet Apparatus	
2	Molecular Pharmacology & Stem Cell	Carbon dioxide Incubator, 150 L capacity with Air jacket for cell culture	1
		Centrifuge (Sorvall ST 8R temp controlled)	
		Clean Bench Biohazard class II Gelman with suction pump	
		Inverted Phase contrast Microscope with UV unit	
		Dell monitor 20" 1pc	
		Microtome paraffin sectioning machine	
		Water Bath	
		Microwave Oven	
		Refrigerator	
		Fume Hood	
		PCR Machine (Thermo Cycle)	
		Water Distillation Plant (Milli-Q)	
		Centrifuge (temp. controlled)	
3	Pharmaceutical Analysis Lab	Centrifuge (non temp. controlled)	1
		Fluorescence Microscope with CCD camera	
		Computer-1 pc, Samsung monitor 18"-1 pc	
		Ice Maker, Norpe	
		Microwave Oven	
		Refrigerator Deep freezer, -20 degree C	
		Refrigerator	
		Digital Weight Balance	
		Gel Documentation system	
		Fume Hood	

Serial	Laboratory Name	Name of Equipment	Unit
		Ultra Sonicator system for tissue and cell homogenization	
		UV Spectrophotometer	
4	Pharmaceutical Microbiology	Autoclave-1	1
		Incubator, Jouan	
		Incubator, capacity-150 L	
		Fume Hood	
		Hot Plate	
		Digital Analytical Balance	
		Colony Counter	
		Autoclave	
		Water bath with shaker	
		Laminar Air Flow	
		Microscope Bio Blue	3
		Refrigerator	2
5	Pharmacognosy & Phytochemistry	Rotary Evaporator with Vacuum Aspirator, Cooling Circulator, Connecting Tube water bath, EYELA Co.	1
		Digital Shaker GFL	
		Oven, capacity-150 L Origin- EC (Spain)	
		Water Bath NB20	
		Water Bath	
		Fume Hood	
		Refrigerator, LG	
		Vacuum Pump (red color)	
		Electronic Weight Balance Digital	2
6	Biopharmaceutics Lab	Automatic Water Distillation Plant, capacity-3.5 L/hour	1
		Digital pH meter	
		Dissolution Tester	
		Fume Hood	
		Friability Tester	
		Nitrogen cylinder	
		Weight Balance	
7		Preparative HPLC	1
		Dehumidifier	

Serial	Laboratory Name	Name of Equipment	Unit
	Inorganic and Physical Pharmacy Lab	GC-MS, Shimadzu	
		HPLC MS with Standard Accessories	
		Fume Hood	
		Ultrasonic Bath	
		FT Infra-Red (IR)	
		Electronic Weight Balance Digital	
8	Pharmacology & Clinical Pharmacy Laboratory	ELISA Reader	1
		Carbon dioxide Cylinder	
		Carbon dioxide Incubator	
		Langendorff System	
		Oxygen Cylinder	
		Fume Hood	
		Lab Tutor System	
		Laminar Air Flow	
		Plethysmometer	
		Peristaltic Pump	
		Portable OT Light	
		Vortex Mixer	
		Deep Freezer (-80°C Refrigerator)	
		Refrigerator	2
9	Physiology & Pharmacology	Carbon dioxide Incubator	1
		Laminar Air Flow	
		Co2 Cylinder	
		Fume Hood	
		Passive Avoidance Conditioning Chamber (Lab Animal)	
		Refrigerator	
		Grinding machine	
10	Pharmaceutical Technology and Cosmetology lab	Automatic Water Distillation Plant	1
		Weight Balance	
		Fume Hood	
		Hot Plate with Magnetic Stirrer	
		Refrigerator	
11	Mini R&D Lab (Analytical)	Analytical Balance	1
		Disintegration Apparatus	

Serial	Laboratory Name	Name of Equipment	Unit	
		Digital pH Meter		
		Dissolution Tester		
		Drying Oven		
		Hot Plate with Magnetic Stirrer, Torreypines		
		Inverted Phase contrast Microscope with UV unit Dell monitor 20" 1pc		
		Ultrasonic processor		
		Vortex Mixer		
		Sonicator bath		
		Karl Fisher Titrator		
		Hand Held Homogenizer		
		Digital viscometer		
12	Mini R&D Lab (Formulation)	Mini Rapid Mixture Granulator	1	
		Digital Electronic Balance		
		Dehumidifier		
		Dry Granulator		
		Tablet Compression Machine		
		Tablet Hardness Tester		
		Fluid Bed Dryer		
		V Blender		
		Capsule Filling Machine		
		Coating Pan with Peristaltic Pump		
		Suppositories Unit		
		Sieve Shaker		
		Bulk Density Tester		
		Hot Plate with magnetic Stirrer		
		Sigma Blade Blender		
		Ribbon Mixer		
		Oven Dryer		
		Friability Tester		
		Planetary Mixer		
		Mini Vibro Type Shifter		
		Moisture Analyzer		
		Laboratory Kneader		
		Polishing drum		

Serial	Laboratory Name	Name of Equipment	Unit
13	Animal House	P-Scale Weight balance	1
14	Animal Preparation Laboratory I		
15	Animal Preparation Laboratory II	Weight Balance	1
16	Behavioral Neuroscience Laboratory		
17	Neuroscience Experiment Lab		
18	NSU Model Pharmacy		

D. Requirements of Instruments and Facilities to Achieve the Research Goals

Research Area I: Neurobiology & Behavioral Neuroscience

1. Fluorescence and confocal Microscope
2. Picodrop/ Nanodrop
3. Real-Time q RT-PCR Machine
4. Flow cytometer
5. Electrophysiology set up
6. Tail-cuff BP machine
7. Blood gas analyzer
8. Stereotaxic frame
9. Stereomicroscope
10. Cryotome
11. Vibrotome

Research Area II: Bioinformatics & AI in drug discovery

1. Three Work Station computers with the specified configuration suitable for Computational studies

Research Area III: Gene Expression & Cellular Biology

1. Westernblot set up
2. Dry bath incubator
3. Thermal cyclers (gradient)
4. UV transillumination
5. Gel electrophoresis tank (vertical and horizontal)
6. Gel documentation (fluorescence and chemiluminescence)
7. ELISA microplate reader
8. Orbital shaker
9. Dry bath
10. ELISA plate washer

11. Semi-auto biochemistry analyzer
12. Gel dryer
13. Pipette gun

Research Area IV: Pharmacology & Toxicology

1. Organ bath/Chymograph
2. UV transluminance
3. UV spectrophotometer
4. Ultrathurax homogenizer

Research Area V: Pharmaceutical Analysis

1. LC-MS
2. GC-MS
3. HPLC
4. Thin Layer Chromatography Plate (TLC plate)
5. UV light (254 nm) for detection of Organic Compound
6. Column for Column Chromatography
7. Silica Gel for Column Chromatography
8. Chem Draw software
9. IR spectroscopy
10. Gel Phase Chromatography (GPC)

Research Area VI: Bioequivalence Studies & Clinical Trials &

Research Area VII: Nanotechnology & Drug Delivery System

1. ATIR
2. Freeze dryer
3. Zeta sizer DLS

Research Area VIII: Redox Biology

1. Oxygraph
2. Fluorescence spectrometer
3. Cell culture facilities,

Research Area IX: Microbiology & Biotechnology

1. Lab scale fermenter
2. Microscope

E. Summary of The Instruments Required to Purchase

Required Instruments:

SI	Name of Instrument	Research Area	Quantity
1	Flow cytometer	I	1
2	Confocal Microscope	I	1
3	Tail-cuff BP machine	I	2
4	Blood gas analyzer	I	1
5	Stereotaxic frame with control module	I	1
6	Stereomicroscope	I	2
7	Vibratome	I	1
8	Centrifuge 4°C temp. controlled	I	2
9	Electrophysiology set up	I	1
10	Work station computers with the specified configuration	II	3
11	Dry bath Incubator	III	1
12	Thermal Cycler (gradient)	LII & I	2
13	Gel Electrophoresis tank (vertical & horizontal)	III	4
14	ELISA Microplate Reader	III	1
15	Orbital shaker	III	3
16	Semi-auto biochemistry analyzer	III	1
17	Pipette aspirator	III	5
18	Organ Bath/Kymograph	IV	1
19	UV light (254nm) for detection of organic compound	V	2
20	Column for Column Chromatography	V	20
21	Chem Draw software	V	1
22	Gel Permeation Chromatography (GPC)	V	1
23	ATIR	VII	1
24	Oxygraph	VIII	1
25	Fluorescence spectrometer	VIII	1
26	Lab scale fermenter	IX	1
27	Microscope (Light, Bright field)	IX	3

Required Laboratory Space:

A separate laboratory space is required for the research area I to establish the Neurobiology Laboratory.

F. Publications in Scopus-Indexed Journals:

Projected numbers of publications/year in SCOPUS-indexed journals				
2024	2025	2026	2027	2028
40	40	45	45	50

G. Projected Number of Grants Acquisitions by the Department for the Period 2024-2028

Year	Number of CTRG Grants	CTRG Grants Amount in lacs (BDT)	External Grants	National/International	Projected Amount in lacs (BDT)
2024	15	67.00	5		25
2025	17	68.00	6		30
2026	19	85.00	7		35
2027	21	94.00	6		30
2028	23	103.00	5		25
Total	95	417.00	29		145

Department of Public Health

A. Summary of Research Priorities:

Research Area	SDG alignment
Research Area I: Infectious diseases (Emerging and re-emerging diseases)	SDG 3.3.1, SDG 3.3.2, SDG 3.3.3
Research Area II: Non-Communicable Diseases	SDG 3.4.1
Research Area III: Mental health and Quality of Life	SDG 3.4.2
Research Area IV: Maternal, Child, and Adolescent Health	SDG 3.1.1, 3.1.2, 3.2.1, 3.2.2, 3.7.2
Research Area V: Women and Gender	SDG 3.7.1, SDG 5.3.1
Research Area VI: Nutritional Health	SDG 2.1.1, 2.2.1, 2.2.2c, 2.2.2d
Research Area VII: Occupational Health and Safety	SDG 3.4.1, 3.c.1
Research Area VIII: Environmental Health and Climate Change	SDG 3.9.1, 3.9.2, 6.1.1, 13.1.1.a, 13.1.1.1b
Research Area IX: Injury Prevention	SDG 3.6.1
Research Area X: Health System Research	SDG 3.8.1, 3.d.1

B. Details of Research Priorities:

Research Area 1: Infectious diseases (Emerging and re-emerging diseases)	
Priorities	<ol style="list-style-type: none"> 1. Establish a functional infectious disease research network throughout the South Asian region 2. Establish a collaborative network with government and non-government hospitals for infectious disease surveillance, like Dengue, Chikungunya, COVID-19, and any other emerging and re-emerging infectious disease. 3. Conduct epidemiologic investigations with prevention and control efforts to reduce the.
Expected outcomes	<ul style="list-style-type: none"> • Publication of research findings in international peer-reviewed journals • A number of seminars and national conferences will be organized, followed by regional and international conference • Develop a regional network of epidemic investigation
Strategies to achieve the goals	<ul style="list-style-type: none"> • Development of joint research proposal • Collaboration with national and international institutes • Increase research capacity by recruiting qualified faculty members, and research staff (research associate and statistician)

Research Area 2: Non-Communicable Diseases	
Priorities	<ol style="list-style-type: none"> 1. Establish a network and collaborate with National and international research institutions and Universities to conduct Non-Communicable Disease (NCDs) research to prevent and control NCDs. 2. Create and follow up a cohort to understand the burden and its risk factors. 3. Promote a healthy lifestyle, mainly targeting children, adolescents, and young adults, including students in schools and universities. 4. Undertake health system research to enhance effective healthcare delivery for Non-Communicable Disease (NCD) management, encompassing primary, secondary, and tertiary prevention. 5. Develop a comprehensive NCD research initiative focused on prevalent diseases such as cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases. 6. Partner with large tertiary-level hospitals/healthcare facilities to collect and analyze routine chronic disease management data. 7. Conduct clinical studies on the risk factors, prognostic factors, and management of NCDs.
Expected outcomes	<ul style="list-style-type: none"> • Publication of research findings in international peer-reviewed journals • A number of seminars and national conferences will be organized, followed by regional and international conference • Develop a regional network of NCD prevention and control

Strategies to achieve the goals	<ul style="list-style-type: none"> • Collaboration with national and international research institutions and academia • Involvement with government initiatives. • Capacity development of faculties • Enhance research culture and environment.
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Research Area 3: Mental Health & Quality of Life

Priorities	<ol style="list-style-type: none"> 1. Establish a network and collaborate with Bangladeshi and international research institutions and Universities to conduct mental health and QoL research for the promotion of mental health and prevention and control of mental health illness. 2. Promote mental health prevention and management for the Bangladeshi population, especially for women, to prevent and control postpartum depression. 3. Promote mental health and QoL among children, adolescents, and young adults, especially school and university students. 4. Design and implement community-based mental health programs for the prevention and control of suicide. 5. Support the government of Bangladesh in expanding mental health services through research and collaboration.
Expected outcomes	<ul style="list-style-type: none"> • Established network and collaborative relationships with national and international research institutions and academia. • High-quality publications in international journals • Organization of seminars and national conferences, followed by regional and international conferences.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Collaboration with national and international research institutions and academia • Involvement with government initiatives. • Capacity development of faculty members • Enhance the research environment.

Research Area 4: Maternal, Child, and Adolescent Health

Priorities	<ol style="list-style-type: none"> 1. Establish a network and collaboration with Bangladeshi and international research institutions and Universities to prevent maternal, childhood, and adolescent mortality and morbidities. 2. Design and conduct epidemiological studies to identify risk factors of neonatal and under-five child mortality and morbidities in Bangladesh 3. Design, implement, and evaluate low-cost, effective interventions to prevent maternal, child and adolescent mortality and morbidity in Bangladesh
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Expected outcomes	<ul style="list-style-type: none"> • Collaboration with national and international research institutions and academia established. • High-quality publications in international journals • Maternal, child, and adolescent health in Bangladesh improve
Strategies to achieve the goals	<ul style="list-style-type: none"> • Research collaboration with national and international research institutions and academia • Establish a Public Health Research laboratory for data analysis and capacity building of students and faculty members

Research Area 5: Women and Gender	
Priorities	<ol style="list-style-type: none"> 1. Gender and Health Disparities and Inequities 2. Gender Equity in Healthcare 3. Women's Reproductive Health and Rights 4. Gender-Specific Diseases and Conditions 5. Gender-Based Violence and Abuse 6. Gender Identity and Sexual Health 7. Intersectionality
Expected outcomes	<ul style="list-style-type: none"> • Improved Women's Health • Gender-Inclusive Healthcare • Empowerment of Women • Gender Equality • Equitable Health Systems • Healthcare Access • Reduced Health Disparities
Strategies to achieve the goals	<ul style="list-style-type: none"> • Research collaboration with national and international research institutions and academia • Establish a Public Health Research laboratory for data analysis and capacity building of students and faculty members • Recruit faculty members with experience in qualitative research

Research Area 6: Nutritional Health	
Priorities	<ol style="list-style-type: none"> 1. Strengthen partnerships with national and international organizations focusing on nutrition. 2. Foster collaboration with other departments within NSU. 3. Emphasize both nutrition-specific and nutrition-sensitive components in research. 4. Explore innovative, cost-effective approaches for surveys and evaluations.
Expected outcomes	<ul style="list-style-type: none"> • Successfully secured grants for the evaluation of nutrition programs. • Publish research findings in peer-reviewed journals. • Present research findings at international conferences

	<ul style="list-style-type: none"> • Publish blogs in reputed newspapers and websites. • Organize lunch and learn sessions with national and international experts. • Offer short courses on nutrition survey methods, anthropometry, and nutrition assessment software.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Actively apply for grants related to nutrition research • Establish a group for sharing updated research findings and grant opportunities. • Conduct training sessions for members on grant proposal and manuscript writing.

Research Area 7: Occupational Health and Safety	
Priorities	<ol style="list-style-type: none"> 1. Develop, gather, and provide reliable and relevant information, analysis, and tools to advance knowledge, raise awareness, and exchange occupational safety and health (OSH) information and good practice that will serve the needs of those involved in OSH. 2. Conduct occupational epidemiologic studies looking at workers exposed to various chemical, biological, or physical (e.g., noise, heat, radiation) agents to determine if the exposures result in the risk of adverse health outcomes in formal and non-formal sectors. 3. Establish a collaborative and functional research network with government and non-government organizations for occupational disease surveillance. 4. Establish a functional global OSH research network.
Expected outcomes	<ul style="list-style-type: none"> • Publication of research findings in international peer-reviewed journals • Organize several seminars, workshops, short courses, and conferences. • Develop a functional global OSH research network.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Develop and submit a collaborative research proposal. • Collaboration with national and international research organizations • Increase research capacity by recruiting qualified faculty members and research staff (research associate and statistician)

Research Area 8: Environmental Health and Climate Change	
Priorities	<ol style="list-style-type: none"> 1. Develop, gather, and provide reliable and relevant information, analysis, and tools to advance knowledge, raise awareness, and exchange environmental health and climate change information and good practices that will serve the needs of those affected in this area. 2. Conduct studies on environmental health and climate change, focusing at people exposed to various exposures that result in the risk of adverse health outcomes. 3. Establish a collaborative and functional research network with government and non-government organizations for environmental health and climate change issues.

	4. Establish a functional global environmental health and climate change research network.
Expected outcomes	<ul style="list-style-type: none"> • Publication of research findings in international peer-reviewed journals. • Organize several seminars, workshops, short courses, and conferences. • Develop a functional global environmental health and climate change research network.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Develop and submit a collaborative research proposal. • Collaboration with national and international research organizations. • Increase research capacity by recruiting qualified faculty members and research staff (research associate and statistician).

Research Area 9: Injury Prevention

Priorities	<ol style="list-style-type: none"> 1. Establish a network and collaboration with National and international research institutions and Universities to conduct injury prevention research to prevent and control injuries. 2. Conducting research to explore the prevalence of risk factors of different types of injuries. 3. Design and implement injury prevention programs for different types of injuries, including road traffic injuries and burns.
Expected outcomes	<ul style="list-style-type: none"> • Publication of research findings in international peer-reviewed journals • Seminars, workshops, short courses, and conferences. • Effective injury prevention services in place.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Collaboration with national and international research institutions and academia. • Involvement with government initiatives. • Capacity development of faculties • Enhance research culture and environment.

Research Area 10: Health System Research

Priorities	<ol style="list-style-type: none"> 1. Establish a network and collaborate with national and international research institutions and universities to conduct health system research to improve health services in Bangladesh. 2. Undertake research to assess health services' strengths and weaknesses across various service delivery levels. 3. Design and implement research for innovative healthcare services and the enhancement of existing services.
Expected outcomes	<ul style="list-style-type: none"> • Publication of research findings in international peer-reviewed journals • Seminars, workshops, short courses, and conferences. • Improvement of existing health service delivery.

Strategies to achieve the goals	<ul style="list-style-type: none"> • Collaboration with national and international research institutions and academia • Involvement with government initiatives. • Capacity development of faculties • Enhance research culture and environment.
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C. Existing Resources in The Department:

Sl. No.	Name of Resources	Name of Equipment
01	Faculty Member with relevant academic and professional background	Dipak Kumar Mitra
		Mohammad Delwer Hossain Hawlader
		Saidur Rahman Mashreky
		Nadira Sultana Kakoly
		Azaz Bin Sharif
		Mohammad Hayatun Nabi
		Shahnaz Parveen
		Shaouki Munir
		Fouzia Khanam
		Imteaz Mahmud
		Zeeba Zahra Sultana
		Shaikh Abdus Salam
02	Graduate Assistant	Recruited semester-wise
03	Research collaborations with national and international institutions and Universities	<ul style="list-style-type: none"> ▪ Johns Hopkins University, USA ▪ Projahnmo Research Foundation (PRF), Bangladesh ▪ International Centre for Diarrheal Diseases Research, Bangladesh (icddr,b) ▪ Sam Houston State University ▪ Hiroshima University ▪ Manitoba University ▪ Mahidol University ▪ Mid Sweden University ▪ LightHouse ▪ HMBD ▪ Tauri Foundation ▪ CSID ▪ SOS Children Village

D. Required Resources/Facilities to Achieve the Research Goals:

1. Establish a Public Health Research Lab with the following facilities
 - a. Computer lab with 32 high-end PCs and equipped with furniture and digital equipment (multimedia, screen, microphone, etc.)
 - b. One laboratory officer with statistical background
 - c. Authentic statistical software (Stata, SPSS)
 - d. Textbooks
2. One Research Associate
3. Recruitment of faculty members with newer skills, especially qualitative research skills

E. Publications in Scopus-Indexed Journals:

Projected numbers of publications/year in SCOPUS-indexed journals				
2024	2025	2026	2027	2028
70	70	75	75	80

F. Projected Number of Grants Acquisitions by the Department for the Period 2024-2028

Year	Number of CTRG Grants	CTRG Grants Amount (BDT)	External Grants	National/ International	Projected Amount in lacs BDT
2024	04	3,000,000.00	1	International	50,000,000.00
2025	04	3,000,000.00	1	International	50,000,000.00
2026	04	3,000,000.00	1	International	50,000,000.00
2027	04	3,000,000.00	1	International	50,000,000.00
2028	04	3,000,000.00	1	International	50,000,000.00
Total	20	15,000,000.00	5	International	250,000,000.00

Department of Environmental Science and Management

A. Summary of Research Priorities:

Research Area	SDG alignment
Research area 1: Air Quality and Atmospheric Science	SDG 3, SDG 13, SDG 11, SDG 15, SDG 8, SDG 14, SDG 9
Research area 2: Climate Change	SDG 13, SDG 3, SDG 10, SDG 1, SDG 4, SDG 2
Research area 3: Disaster Science and Management	SDG 13, SDG 11, SDG 6, SDG 9, SDG 14, SDG 15
Research area 4: Ecohydrology	SDG 6, SDG 15, SDG 13, SDG 9
Research area 5: Energy Management	SDG 7, SDG 13, SDG 12, SDG 15, SDG 11
Research area 6: Environmental Health	SDG 3, SDG 4, SDG 6, SDG 11, SDG 13, SDG 15
Research area 7: Environmental Policy and Governance	SDG 7, SDG 8, SDG 9, SDG 11, SDG 12, SDG 13, SDG 15, SDG 16, SDG 17
Research area 8: Industrial Ecology/Circular Economy	SDG 6, SDG 9, SDG 11, SDG 12, SDG 15, SDG 17
Research area 9: Natural Resource Management	SDG 2, SDG 6, SDG 12, SDG 13, SDG 14, SDG 15
Research area 10: Pollution Control and Mitigation	SDG 3, SDG 6, SDG 9, SDG 11, SDG 12, SDG 15
Research area 11: Sustainability	SDG 3, SDG 6, SDG 11, SDG 12, SDG 13
Research area 12: Urban and Regional Planning	SDG 1, SDG 10, SDG 11, SDG 12, SDG 13, SDG 15, SDG 16.
Research area 13: Waste Management	SDG 2, SDG 6, SDG 7, SDG 12, SDG 14, SDG 15
Research area 14: Water Resource Management	SDG 3, SDG 6, SDG 9, SDG 11, SDG 13, SDG 14, SDG 15

[The research areas are listed alphabetically, not in any particular order of priority]

B. Details of Research Priorities

Research Area 1: Air Quality and Atmospheric Science	
Priorities	1.1 Long term air quality trend, atmospheric variability and its processes 1.2 Ambient and indoor air quality connecting to agriculture, forest, urban, economy and people’s well-being 1.3 Reactive gases in the atmospheric environment 1.4 Air pollution, monitoring, management and mitigation 1.5 Aerosol climatology characterization 1.6 Coastal meteorology 1.7 Remote sensing for retrieval of the atmospheric compositions 1.8 Urban air pollution and transboundary impacts 1.9 Indoor air pollution 1.10 Impact of climate change and pollution on economy and other societal factors 1.11 Aerosol - compositions, size distribution, new particle formation (NPA) and its meteorology interactions 1.12 Secondary aerosol 1.13 Volatile organic compounds reduction by biotrickling filter
Expected outcomes	<p>Improved Public Health: Understanding long-term air quality trends, atmospheric variability, and processes (1.1) as well as addressing indoor air pollution (1.9) can lead to more effective monitoring and management strategies. This knowledge has the potential to improve public health by mitigating the impact of air pollution on people's well-being.</p> <p>Sustainable Urban Development: Research on urban air pollution and its impacts (1.8) is crucial for developing sustainable urban policies. This knowledge can inform city planning and management, promoting healthier living environments and minimizing the adverse effects of air pollution on urban areas.</p> <p>Climate Change Resilience: Investigating the impact of climate change and air pollution on the economy and other societal factors (1.10) is essential for building resilience. The research in aerosol climatology characterization (1.5) and coastal meteorology (1.6) contributes to a better understanding of (i) atmospheric compositions and can aid in developing strategies to mitigate the effects of climate change and (ii) interaction between climate change and air pollution</p>
Strategies to achieve the goals	<ul style="list-style-type: none"> • We plan to organize discussions at the policy level involving the government and pertinent stakeholders. • We intend to engage in partnerships with both local and international organizations. • Laboratory facilities and research assistants will be employed for the examination and analysis of outcomes. • Additionally, our colleagues will submit applications for research grants.

Research Area 2: Climate Change	
Priorities	<p>2.1 Collaborative research on climate change induced vulnerability</p> <p>2.2 Collaborative ‘critical climate project’ to explore potential of self-reflective higher education pedagogies for inclusive sustainable development under Sustainable Development Goal (SDG) 13 on climate change and also SDG 3 on health and wellbeing and SDG 10 on reduced inequalities.</p> <p>2.3 Climate change adaptation: crop production (cereals, fruits, vegetables, jute etc.) In drought, heat and salinity stress situation</p> <p>2.4 Climate finance inflow and analysis among LDCs</p> <p>2.5 Research on detailed profile analysis of climate finance projects</p> <p>2.6 GHGs emission and short-lived climate forcers</p> <p>2.7 Climate modeling towards radiative forcing</p> <p>2.8 Aerosol climatology and coastal meteorology</p> <p>2.9 Climate smart agriculture</p>
Expected outcomes	<p>Enhanced Climate Resilience: Collaborative research on climate change-induced vulnerability (2.1) and climate change adaptation in crop production (2.3) contributes to building resilience in communities facing environmental challenges, ensuring sustainable food production.</p> <p>Inclusive Sustainable Development: The collaborative 'critical climate project' (2.2) addresses multiple Sustainable Development Goals (SDG 13, SDG 3, SDG 10), promoting self-reflective higher education pedagogies for inclusive sustainable development and reduced inequalities.</p> <p>Strategic Climate Finance Analysis: Research on climate finance inflow and detailed profile analysis of climate finance projects (2.4, 2.5) aids in strategic planning and allocation of resources, particularly among Least Developed Countries (LDCs).</p>
Strategies to achieve the goals	<ul style="list-style-type: none"> • To achieve the goals, we will arrange policy-level dialogues with government and all other relevant stakeholders • We will be collaborating with local and international organizations • We will use the lab facilities and research assistants to test and analyze the results • Our colleagues will apply for research grants

Research Area 3: Disaster Science and Management	
Priorities	<p>3.1 Deep learning based coastal flooding and tidal surge modeling for coastal community and biodiversity</p> <p>3.2 Spatial modeling for Industrial water pollution from anthropogenic disasters</p> <p>3.3 Plastic and Oil spill pollution impact on Coastal Mangroves</p> <p>3.4 Climate induced geodetic deformation of solid earth in the South Asian region</p> <p>3.5 The impact of methane leakage on surrounding environment</p>

	<p>3.6 Disaster and emergency risk management</p> <p>3.7 ICT based loss and damage and vulnerability assessment</p>
Expected outcomes	<p>Community Resilience: Deep learning-based coastal flooding modeling (3.1) enhances community preparedness by providing accurate predictions, safeguarding coastal communities and biodiversity from tidal surges.</p> <p>Environmental Protection: Spatial modeling for industrial water pollution (3.2) aids in preventing anthropogenic disasters, protecting water resources, and mitigating the social impacts of industrial pollution on local communities.</p> <p>Ecosystem Preservation: Research on plastic and oil spill pollution impact on coastal mangroves (3.3) contributes to the preservation of coastal ecosystems, ensuring the well-being of both the environment and communities dependent on these vital habitats.</p>
Strategies to achieve the goals	<ul style="list-style-type: none"> • Utilize high-resolution satellite data for continuous monitoring of the environment to identify air and water pollution sources. • Implementation of deep learning algorithms to analyze spatial data for detecting hazard identification, analysis, and prediction. • Develop a vulnerability index for area specific hazards and to prioritize conservation efforts in areas most affected by pollution. • Establish a framework for continuous monitoring of Aboveground Biodiversity and Carbon sequestration capacity.

Research Area 4: Ecohydrology	
Priorities	<p>4.1 Extrapolating plant water-use from individual trees to stand scales</p> <p>4.2 Forest management practices and catchment water yield nexus</p> <p>4.3 Predicting ecosystem behavior based on small-scale plant functional trait variations</p> <p>4.4 Water use partitioning of trees of different sizes under drought conditions</p> <p>4.5 Water use partitioning strategies of high mortality species: understanding tree survival mechanism during drought</p> <p>4.6 Enhancing hydrological model performance in predicting discharge by integrating plant water use data</p> <p>4.7 Plant Water Uptake Strategies: Variations Across Vegetation Types and Climatic Conditions</p> <p>4.8 Assessing plant water stress at landscape scale using remote sensing techniques</p> <p>4.9 Effects of drought on carbon storage and transpiration</p> <p>4.10 Quantification and mapping of groundwater dependent ecosystems using remote sensing techniques</p>

Expected outcomes	<p>Water Resource Management: Research on plant water-use extrapolation (4.1) and forestry practices' impact on water yield (4.2) informs sustainable water resource management, crucial for communities dependent on these ecosystems.</p> <p>Ecosystem Resilience: Understanding small-scale trait variations (4.3) and tree water uptake patterns during drought (4.4) aids in predicting and enhancing ecosystem resilience, benefiting communities relying on these environments.</p> <p>Climate-Responsive Planning: Investigating plant water uptake strategies (4.7) and using remote sensing for water stress (4.8) provides valuable insights for climate-responsive reforestation programs and landscape planning, ensuring adaptive strategies for future challenges.</p>
Strategies to achieve the goals	<p>Both national and international collaboration is required for the successful implementation of the research priorities. Few instruments and products such as sap flux sensors, dendrometers, increment borer, soil moisture sensors and high-resolution satellite images (LiDAR product) are required to address these questions. Grant applications will be submitted to secure enough funds for the successful implementation of the mentioned projects.</p>

Research Area 5: Energy Management	
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Priorities	<p>5.1 Projects on waste to energy and their monetary valuation</p> <p>5.2 Research on the production of green energy (biofuel - clean energy) from non-food, drought and heat-resistant energy crops</p> <p>5.3 Collaborative research on geothermal energy</p> <p>5.4 Collaborative research on EIA of exploration activities in the gas fields and coal fields of Bangladesh</p> <p>5.5 Research on the inclusion of renewable energy in the energy mix</p> <p>5.6 Projects focusing on the economic and environmental impact of fossil fuel-based power plants</p> <p>5.7 Reviewing different energy management policies focusing on the environmental cost-benefit analysis</p> <p>5.8 Research on the emergence of the electric vehicle market and its efficiency</p>
Expected outcomes	<p>Renewable Energy Transition: Projects on waste to energy (5.1) and research on non-food, drought-resistant energy crops (5.2) contribute to transitioning toward sustainable and clean energy sources, reducing dependence on traditional fossil fuels.</p> <p>Environmental Impact Assessment: Collaborative research on geothermal energy (5.3) and the environmental impact assessment of gas exploration (5.4) ensures responsible energy practices, addressing environmental concerns and fostering sustainable development.</p> <p>Policy Influence and Efficiency: Research on renewable energy inclusion (5.5) and the economic and environmental impact of fossil fuel-based power plants (5.6)</p>

	informs energy management policies, promoting a balanced energy mix and fostering efficiency in the emerging electric vehicle market (5.8).
Strategies to achieve the goals	<ul style="list-style-type: none"> • To address the goals, we will arrange policy-level dialogues with government and all other relevant stakeholders • We will be collaborating with local and international organizations • We will use the lab facilities and research assistants to test and analyze the results • Our colleagues will apply for research grants

Research Area 6: Environmental Health	
Priorities	<p>6.1 Climate variability on mortality and disease burden</p> <p>6.2 Inorganics exposure and health risk</p> <p>6.3 Organics and emerging contaminants and environmental as well as human health risk</p> <p>6.4 Legacy and emerging pollutants</p> <p>6.5 Pollutants - health interactions</p> <p>6.6 Respiratory absorption of the xenobiotics</p> <p>6.7 Green space and its association with mental health</p> <p>6.8 Knowledge Attitude and Perspective (KAP) of targeted respondents on environmental variable and its processes</p>
Expected outcomes	<p>Public Health Resilience: Research on climate variability and its impact on mortality and disease burden (6.1) contributes to understanding and building resilience against health challenges influenced by climate changes.</p> <p>Environmental Health Awareness: Investigating inorganics exposure, organics, and emerging contaminants (6.2, 6.3) sheds light on associated environmental and human health risks, promoting awareness and informed decision-making.</p> <p>Mental Health and Green Spaces: Exploring the association between green spaces and mental health (6.7) contributes to urban planning strategies that enhance well-being, addressing societal concerns related to mental health. These align to SDG3 and SDG12. Thus, it will help achieving for the health and well-being of the people in the country.</p>
Strategies to achieve the goals	<ul style="list-style-type: none"> • Our strategy involves facilitating high-level policy discussions with the government and relevant stakeholders. • We aim to establish partnerships with both local and international organizations. • The examination and analysis of outcomes will be conducted using laboratory facilities and research assistants. • Furthermore, our colleagues will be submitting applications for research grants

Research Area 7: Environmental Policy and Governance	
Priorities	<p>7.1 Research on several climate governance models for sustainable development of natural resources</p> <p>7.2 A comparative analysis of different climate diplomacy models and their implications on the global climate issues</p> <p>7.3 Collaborative research to initiate a draft electric vehicle policy guideline</p> <p>7.4 Evaluating the economics behind different green policies and its role in job creation, green industries and economic growth</p> <p>7.5 Reviewing Corporate environmental responsibilities and environmental regulations between several countries</p> <p>7.6 Research on integrating energy policies with environmental policies focusing on cost benefit analysis</p> <p>7.7 Collaborative research on several climate adaptation and mitigation plans and their implications</p> <p>7.8 Examining how different new technologies can be adopted to improve the monitoring and enforcement of several environmental policies</p>
Expected outcomes	<p>Sustainable Resource Development: Research on climate governance models (7.1) contributes to sustainable development, ensuring the responsible use of natural resources and fostering long-term environmental health.</p> <p>Global Climate Diplomacy Impact: Comparative analysis of climate diplomacy models (7.2) provides insights into their implications on global climate issues, influencing international collaborations for climate action.</p> <p>Green Policy Guidelines: Collaborative research on electric vehicle policy guidelines (7.3) lays the foundation for sustainable transportation, impacting environmental conservation and promoting eco-friendly practices in the automotive industry.</p>
Strategies to achieve the goals	<p>We will set up policy-level discussions with the government and all other pertinent parties in order to accomplish the aims. We intend to engage in partnerships with both domestic and global institutions. We'll examine and evaluate the findings using the lab's resources and research assistants. Our associates intend to submit grants for study.</p>

Research Area 8: Industrial Ecology / Circular Economy	
Priorities	<p>8.1 National and international collaboration in the broader domain of sustainable textiles</p> <p>8.2 Resource recovery, resource/impact decoupling, water footprint, and pollution control in the textile sector through zero liquid discharge</p> <p>8.3 Develop research facilities using membrane separation technology to achieve resource recovery and minimize energy and water use in industrial</p>

	<p>sector and contribute in better effluent treatment and reduce environmental pollution.</p> <p>8.4 Substance/material flow analysis (SFA/MFA) of substances/materials which are creating environmental burden or are non-renewable in nature (in Bangladesh perspective)</p> <p>8.5 Effects of urbanization on phosphorus and nitrogen metabolism in Bangladesh</p> <p>8.6 Developing industrial symbiotic network to decouple resources</p> <p>8.7 Understanding the mechanism to shape circular bioeconomy in Bangladesh</p> <p>8.8 Prospects of urban mining to achieve a circular economy in Bangladesh</p> <p>8.9 Comparative LCA and substance flow analysis of LAB (lead-acid battery) industry</p> <p>8.10 Sustainability of sand in the age of Anthropocene</p> <p>8.11 Mainstreaming “Industrial Succession”</p> <p>8.12 Fundamental theory on uncertainty</p>
Expected outcomes	<p>Sustainable Textiles Collaboration: National and international collaboration in sustainable textiles (8.1) promotes ethical and eco-friendly practices, impacting the textile industry's social responsibility and global environmental efforts.</p> <p>Textile Sector Sustainability: Research on zero liquid discharge and membrane separation technology (8.2, 8.3) enhances resource recovery, minimizes environmental impact, and contributes to pollution control, fostering sustainable practices in the industrial sector.</p> <p>Circular Economy Initiatives: Development of industrial symbiotic networks (8.6), shaping a circular bioeconomy (8.7), and exploring urban mining prospects (8.8) contribute to resource decoupling and sustainable practices, influencing the transition toward a circular economy in Bangladesh.</p>
Strategies to achieve the goals	<ul style="list-style-type: none"> • We are expecting to receive USD 50,000 from UNDP to address a part of Goal 8.2. (water footprint) • We have already received some USD 6,000 to address Goal 3.3 from NSU and expecting another USD 50,000 from UNDP • We have drafted our proposals to address Goal 8.4 and 8.5 to be submitted to Ministry of Industry and Ministry of Planning of Bangladesh Government. Besides, we are planning to submit our proposals to some foreign granting agencies. • We will also arrange policy-level dialogues with government and all other relevant stakeholders

Research Area 9: Natural Resource Management	
Priorities	<p>9.1 Cost-effective eco-friendly development project design</p> <p>9.2 Economic valuation of ecosystems</p> <p>9.3 Spatio-temporal changes of the land covers/land uses (e.g. forest, agricultural land)</p> <p>9.4 Forest/agriculture/water policy changes and restoration/conservation outcomes</p> <p>9.5 Spatio-temporal dynamics of tropical forests/agricultural systems carbon stock</p> <p>9.6 Resolving conflicts between biodiversity conservation/ecosystem restoration and food security</p> <p>9.7 Developing user-friendly tools for community-led ecosystem (e.g., agriculture/forest/aquatic) monitoring techniques</p> <p>9.8 Ecosystem restoration through climate-smart adaptation and mitigation technologies (more emphasis on mitigation)</p> <p>9.9 Tidal River Management: sustainable strategies for Land Accretion and River Restoration</p> <p>9.10 Influence of tree harvesting on the species composition and functioning of ecosystems</p> <p>9.11 Impact of ocean acidification on the productivity of marine ecosystems</p> <p>9.12 Influence of atmospheric changes on the primary production of terrestrial ecosystems</p> <p>9.13 Identification of ecosystem tipping point</p>
Expected outcomes	<p>Community-Centric Development: Research on cost-effective, eco-friendly project design (9.1) promotes socially inclusive and environmentally conscious development, positively impacting local communities and ecosystems.</p> <p>Economic and Ecological Balance: Economic valuation of ecosystems (9.2) contributes to informed decision-making, ensuring a balance between economic development and ecological preservation, benefiting both society and the environment.</p> <p>Conflict Resolution for Sustainable Practices: Resolving conflicts between biodiversity conservation and food security (9.6) fosters sustainable policies, addressing social concerns while promoting environmental conservation and food stability.</p>
Strategies to achieve the goals	Funding is the major challenge. Experts will apply for internal and external grants.

Research Area 10: Pollution Control and Mitigation	
Priorities	<p>10.1 Research on air, water, and soil quality and chemical & physical composition of pollution hotspots</p> <p>10.2 Research on visual Pollution and its policy implications</p> <p>10.3 Evaluate the efficiency of different pollution removal technology</p> <p>10.4 Application of adsorbent on heavy metal remediation</p> <p>10.5 Application of Bioreactor for treating Odorous and Volatile organic compounds (VOCs)</p> <p>10.6 Removal and recovery of nutrients from wastewater using lab scale based anaerobic sludge bed reactor</p> <p>10.7 Treatment of wastewater with MBR</p> <p>10.8 Effectiveness of macrophyte filter (Helyofilter) to reduce pollution</p>
Expected outcomes	<p>Healthier Environments: Research on air, water, and soil quality in pollution hotspots (10.1) directly impacts public health by identifying and addressing the chemical and physical composition of pollutants, leading to improved environmental conditions.</p> <p>Policy Enhancement for Visual Quality: Exploring visual pollution and its policy implications (10.2) contributes to urban planning and policy development, ensuring aesthetically pleasing surroundings and addressing the social impact of visual pollution on communities.</p> <p>Sustainable Pollution Remediation: Evaluating pollution removal technologies, such as adsorbents for heavy metal remediation (10.4) and bioreactors for treating odorous compounds (10.5), supports sustainable and efficient pollution control, positively impacting both the environment and public well-being.</p>
Strategies to achieve the goals	<ul style="list-style-type: none"> • To address Goal 10.1, atmospheric sampling and analysis facilities will have to be established and developed at NSU. Moreover, atmospheric monitoring data, satellite images and atmospheric models will be utilized to address this goal. • To address Goal 10.1, collaborative research projects proposals will be submitted for international internal grant applications • To address Goal 10.2, we have applied for research grant (USD 70,000) from Toyota Foundation.

Research Area 11: Sustainability	
Priorities	<p>11.1 Research on environmental changes to achieve the following SDGs:</p> <p>SDG 3: Health and well-being of the people at all ages</p> <p>SDG 6: Clean water and sanitation</p> <p>SDG 11: Sustainable Cities and Communities</p> <p>SDG 12: Responsible Consumption and Production</p> <p>SDG 13: Action to combat climate change and its impact</p>

Expected outcomes	Overall, research in sustainable environmental management aligned with SDG goals can play a crucial role in advancing our understanding of environmental issues and promoting practices that lead to a more sustainable and resilient future.
Strategies to achieve the goals	To support the research, we will integrate existing student thesis projects. To reach our objectives, we plan to organize policy-level discussions with the government and other pertinent stakeholders. Additionally, we will engage in partnerships with both local and international organizations to disseminate information and for research purposes. The analysis of results for a more comprehensive understanding will be conducted using laboratory facilities and research assistants.

Research Area 12: Urban and Regional Planning

Priorities	<p>12.1 Research on Socio-economic Indicators of Slums in Dhaka</p> <p>12.2 Contribute to the understanding of the trend and drivers of changing nature of human settlements and its interaction with existing and potential environmental issues (Geographic focus: Bangladesh and to a lesser extent, other countries of South Asia)</p> <p>12.3 Provide insights into urban resilience in the face of rapid urbanization as well as changes in weather patterns, resource depletion, and hazards</p> <p>12.4 Study of environmental justice in urban planning and governance</p> <p>12.5 Study of urban environmental problems and policy responses to them</p> <p>12.6 Explore ways of citizen and private sector participation in urban environmental management.</p> <p>12.7 Urban Heat Islands and its impact</p>
Expected outcomes	<p>Empowering Slum Communities: Research on socio-economic indicators of slums in Dhaka (12.1) aims to empower marginalized communities by providing insights into their socio-economic conditions, contributing to targeted interventions and policy improvements.</p> <p>Enhancing Urban Resilience: Understanding the changing nature of human settlements and its interaction with environmental issues (12.2) provides critical insights into urban resilience, helping communities adapt to rapid urbanization, weather pattern changes, resource depletion, and hazards.</p> <p>Promoting Environmental Justice: The study of environmental justice in urban planning and governance (12.4) contributes to fair and equitable urban development, ensuring that environmental benefits and burdens are distributed justly among diverse socio-economic groups.</p>
Strategies to achieve the goals	<ul style="list-style-type: none"> • To facilitate the research, we will incorporate ongoing student thesis projects • To achieve the goals, we will arrange policy-level dialogues with government and all other relevant stakeholders • We will also be collaborating with local and international organizations for information dissemination and research purpose

	<ul style="list-style-type: none"> • We will use lab facilities and research assistants to analyze the results for better understanding
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Research Area 13: Waste Management

Priorities	<p>13.1 Research on converting waste into energy via anaerobic digestion process</p> <p>13.2 Research on fish waste conversion into fish food</p> <p>13.3 Research on phytoremediation of industrial waste water by aquatic energy crops</p> <p>13.4 Research on waste management through biodegradation processes</p> <p>13.5 Treatment of wastewater with MBR</p> <p>13.6 Removal and recovery of energy and nutrients from wastewater</p> <p>13.7 Waste reduction by pyrolysis and incineration process</p>
Expected outcomes	<p>Sustainable Energy Production: Research on waste-to-energy via anaerobic digestion (13.1) contributes to sustainable energy practices, reducing dependence on traditional sources and positively impacting communities through cleaner energy alternatives.</p> <p>Circular Economy in Aquaculture: Converting fish waste into fish food (13.2) promotes a circular economy in aquaculture, minimizing waste and contributing to sustainable practices in the fishing industry.</p> <p>Clean Water through Phytoremediation: Research on phytoremediation of industrial wastewater (13.3) using aquatic energy crops helps improve water quality, benefiting communities and ecosystems affected by industrial pollution.</p>
Strategies to achieve the goals	<ul style="list-style-type: none"> • To achieve the goals, we will arrange policy-level dialogues with government and all other relevant stakeholders • We will also be collaborating with local and international organizations for information dissemination and research purpose • We will use extensive lab facilities and research assistants to test and analyze the results for further implications

Research Area 14: Water Resource Management

Priorities	<p>14.1 Research on Sustainable Arsenic Mitigation</p> <p>14.2 Research on Applications of Environmental Geophysics in Groundwater Monitoring</p> <p>14.3 Research on Groundwater/Surface water Pollution</p> <p>14.4 Research on Groundwater Modeling</p> <p>14.5 Watershed management plan</p> <p>14.6 Research on water safety and sanitation plan</p> <p>14.7 Quantification of crustal elastic response due to loading of monsoon floodwater</p> <p>14.8 Coastal sediment dynamics</p> <p>14.9 Integrated Water resource management (IWRM)</p>
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	14.10 Collaborative research on tidal river management 14.11 Research on tidal river forecast
Expected outcomes	<p>Safe Drinking Water: Research on sustainable arsenic mitigation (14.1) directly impacts public health by ensuring safe drinking water, particularly in regions affected by arsenic contamination.</p> <p>Effective Groundwater Monitoring: Applications of environmental geophysics in groundwater monitoring (14.2) improve the efficiency and accuracy of monitoring efforts, enhancing our ability to address and prevent groundwater pollution.</p> <p>Holistic Water Management: Integrated water resource management (14.9) and collaborative tidal river management (14.10) contribute to comprehensive watershed and river basin planning, fostering sustainable practices, generating localized warning for tidal surge and benefiting both coastal communities and ecosystems.</p>

C. Existing Equipment in The Department:

Software and data handling resources:

- Rstudio
- QGIS
- Google Earth Engine
- Igor Pro 9.0
- Air Quality Models
- GrADS
- Risk Analysis Models (Deterministic and Probability)
- Multivariate receptor modeling (E.g., Receptor Modeling Prediction for Potential Sources of Pollutants)
- Chemometrics modeling
- Generalized Additive Modeling (GAM)
- Case Crossover Modeling
- Dosimetric Airways Modeling
- Deterministic Health Risk Modeling
- Air mass dispersion modeling
- Potential Source Contribution Function (PSCF)
- GPS
- GIS Lab
- SPSS software
- Health Belief Model
- Theory of Planned Behaviour
- Likert Scale

Human resources:

- Research assistants
- Lab officer
- Expert faculty members

Laboratory resources:

- Active air sampler
- Passive air sampling devices
- GCFID
- Furnace
- IC
- Electronic Balance
- Concentration Weighted Trajectory (CWT)
- Mini multi-media projector
- HP IDS Z4 G4 WKS
- Range Finder
- Ion Chromatograph
- Gas Chromatograph
- Atomic Absorption Spectrometer (almost redundant)
- Small anaerobic digester
- Incubator
- Laminar Air Flow
- 4°C Refrigerator
- Electronic Balance
- Micropipette
- Autoclave Machine
- pH Meter
- Spectrophotometer
- Microwave oven
- Distilled Water Plant
- Auger
- EC meter

D. Required Instruments/ Facilities to Achieve the Research Goals

Research area 1. Air Quality and Atmospheric Science

Priority 1.1

- SN-GCJA5 PM sensor

Priority 1.13

- The vigi e-nose,Auto GC866 Analyzers - Odor Solutions to track VOCs, Sulfur compounds

Research area 2. Climate Change

Priority 2.4.

- Drone
- Satellite Image
- Moisture meter
- Lease of land for cultivation of crops (food crops)
- Green house establishment
- Growth chamber establishment
- Tensiometer
- Photosynthetic meter
- Leaf area meter
- Portable digital grain moisture meter
- Sieving apparatus
- Seed germination box (Growth chamber, green house)
- Pressure plate apparatus
- Water potential meter
- GPS for soil survey
- Proposed budget: Will cost around BDT 2 crores.

Priority 2.7:

- Erdas Imagine Software
- Proposed budget: 2000 USD

Research area 3. Disaster Science and Management

Priority 3.5:

- Workstation
- Loss and damage assessment
- Vulnerability assessment
- Drone
- Methane gas analyzer
- In situ measurement of methane concentration

Research area 4. Ecohydrology

- Essential tools and products, including sap flux sensors, dendrometers, increment borers, soil moisture sensors, and high-resolution satellite images (LiDAR product), are crucial for addressing these inquiries.

Research area 5. Energy Management

Priority 5.2:

- Lease of land for cultivation of energy crops (nonfood)
- Lease of water bodies (aquatic macro and microphytes- for cultivation of water hyacinth, duckweed, water lettuce, Azolla, algae etc) for production of raw Biofuels (biogas, ethanol and biodiesel) as source of clean energy
- Establishment of Bioenergy laboratory (processing, conversion, uses etc)
- Biomass crusher/processor
- Blender
- Gas and liquid chromatography
- Specific gravity meter
- Proposed budget: BDT 2 crores

Priority 5.3:

- JLog® Petrophysical Software
- Interpex IX1D v 3 forward and inverse modeling in terms of a layered earth with resistivity
- Proposed budget: USD 5,094 (1,595 + 3,499)

Research area 6. Environmental Health

Priority 6.1, 6.5 & 6.6:

- QIAamp Viral RNA isolation kit (Qiagen, Germany)
- Research assistants

Priority 6.7:

- Ethical approval for data collection

Research area 7. Environmental Policy and Governance

Priority 7.1 to 7.8:

- 6 Research assistants
- Access to secondary data (Budget: 1000USD)
- Field survey for primary data collection

Research area 8. Industrial Ecology / Circular Economy

Priority 8.2:

- Research Assistant: 3,
- Office space to accommodate the research assistant, field survey and data acquisition
- Proposed budget: Research Student: (BDT 30,000×3), field survey and data acquisition (BDT 1,500,000)

Priority 8.4:

- Software: 1
- Field survey
- Proposed budget: Software: (BDT 55,000), field survey (BDT 250,000)

Priority 8.5:

- Software: 1
- Field survey and data acquisition
- Proposed budget: Field survey and data acquisition (BDT 500,000)

Priority 8.6:

- Workstation (1), Office space to accommodate my research students
- Proposed budget: Workstation: 1 (BDT 300,000)

Research area 9. Natural Resource Management

Successful implementation of research priorities requires cooperation on both national and international scales. Adequate funding is crucial for executing each of the priorities

Research area 10. Pollution Control and Mitigation

Priority 10.1:

- Low volume air sampler for sampling particulate matters of different size fractions
- Microbalance (5-6 decimal point)
- Standard reference material (for trace elements and organic compounds)
- High purity microfiber filters for air sampling (2 boxes i.e. 200 pcs)
- Inductively Coupled Plasma-Optical Emission Spectrometer [ICP-MS]
- Software: Tableau (for data analysis)
- Proposed budget: BDT 23,00,000 (a-10,00,000, b-6,00,000, c-2,00,000, d-1,00,000, f-4,00,000)

Priority 10.2:

- Research Assistants: 3
- GPU: 1
- Field survey and data acquisition
- Proposed budget: Research Student: (BDT 50,000×3), GPU (BDT 300,000), Field survey and data acquisition (BDT 1,000,000)

Research area 11. Sustainability

The successful execution of research priorities necessitates collaboration at both national and international levels. To ensure adequate funding for the projects, grant applications will be diligently submitted

Research area 12. Urban and Regional Planning

Priority 12.2:

- Computer 3-D graphics team and software
- Proposed budget: 70,000 BDT

Priority 12.3:

- Daily weather data
- Proposed budget: 60,000 BDT

Priority 12.4:

- Survey research, mapping in Khulna, Maijdee and Sirajganj
- Proposed budget: 200,000 BDT

Research area 13. Waste Management

Priority 13.1:

- Raw waste material collection and anaerobic digestrate collection
- Gas collection balloons
- Bio gas analysis at BSIRC
- Budget: 400,000 Tk

Priority 13.2:

- A fish tank of 3000 liters
- Air blower
- pH meter
- TDS meter
- DO meter
- Ammonia measurement kit
- Fish fry 1000
- Fish feed 300 kg per batch
- Probiotics
- Proposed budget: 200,000 BDT

Research area 14. Water Resource Management

Priority 14.1. and 14.3:

- ICP-OES (Inductively coupled plasma - optical emission spectrometer)
- Research student: 2
- Proposed budget: USD 29,500

Priority 14.2:

- US RADARinc GPR
- Proposed budget: USD 14,000

E. Publications in Scopus-Indexed Journals:

Projected numbers of publications/year in SCOPUS-indexed journals				
2024	2025	2026	2027	2028
30	35	35	35	40

F. Projected Number of Grants Acquisitions by The Department for the Period 2024-2028

Year	CTRG		External		
	Number of CTRG Grants	CTRG Grants Amount (BDT)	External Grants	National/International	Projected Amount (BDT)
2024	5	2,500,000	0	NA	NA
2025	7	3,500,000	1	National	2,400,000
2026	9	4,500,000	1	International	2,400,000
2027	10	5,000,000	1	International	2,400,000
2028	11	5,500,000	1	International	2,400,000
Total	42	21,000,000	4	-	9,600,000

Department of Biochemistry and Microbiology

A. Research Priorities:

Research Area		SDG alignment
Research Area I:	Genomics	SDG 2, 3, 9, 12
Research Area II:	Prevalence and Mechanism of Antibiotic Resistance in Clinical and Environmental Samples	SDG 3, 9
Research Area III:	Biocontrol and Bioremediation	SDG 3, 6, 9
Research Area IV:	Food Safety and Security	SDG 1, 2, 12
Research Area V:	Disease Pathogenesis and Host-Pathogen Interactions	SDG 3, 9
Research Area VI:	Computational and Experimental Approaches to Identify Therapeutic Compounds	SDG 3, 9

B. Details of Research Priorities:

Research Area I: Genomics	
Priorities	<p>1.1 Functional genomics: To study genome structure and function that contributes to health by exploring the genetic, epigenetic, and metagenomic basis of human disorders. To identify, collect, and use data from sequencing for the predominant spectrum of pathogens variants responsible for infectious diseases and their association with the pathogenesis in Bangladesh.</p> <p>1.2 Comparative & computational genomics: Aims to compare genomic features between different species. Studies of key computational methods directly linked to drug discovery and chemical biology.</p> <p>1.3 Mutation genomics: Studies the genome in terms of mutations that occur in a person's DNA or genome. Identification of specific genetic variations, the predominant spectrum of pathogenic mutations, and their association with non-communicable diseases and determination of treatment strategies or dose adjustment recommendations in the Bangladeshi population.</p> <p>1.4 Medical application: To establish advanced molecular biology techniques in clinical diagnostic settings in Bangladesh. Development of Rapid Diagnostic Test (RDT) assay kit for the early and accurate diagnosis as Point-Of-Care (POC). To establish potential biomarkers that can be used to predict the risk of disease, to enable early detection of disease, to improve treatment selection.</p> <p>1.5 Environmental genomics: To learn the compound genome of the whole microbiota. The use of 16S metagenomics approaches to evaluate the gut microbiome (specifically bacteria and some crucial viruses).</p>

Expected outcomes	<p>Anticipated social impacts with reference to Health status and Health Service:</p> <ul style="list-style-type: none"> • The long-term goal is to successfully transform laboratory findings into improved diagnoses and therapeutics for human disorders. The study results might contribute to the improvements of health status in the Bangladeshi population by following appropriate interventions, preventive strategies that will reduce morbidity and mortality & will help to adopt in national policy. • The results of the study will validate the establishment of molecular biology techniques including NGS technology as one the sustainable technology in clinical diagnostic services in Bangladesh to measure and monitor health status against prevalent infectious diseases, vector borne diseases as well as non-communicable diseases. <p>Research Impacts:</p> <ul style="list-style-type: none"> • The research results will be disseminated by publishing in peer-reviewed, high-impact Q1 SCOPUS-indexed scientific journals, by participating in National/International conference presentation. • The study results will open the Molecular Biology Techniques including NGS technology to be used by all public and private level researchers in Bangladesh. • Students' employment as research associate in North South University and other esteemed research universities/organizations to enhance research and resources to maximize public health benefit. • Enhancement of the collaboration in home and abroad.
Strategies to achieve the goals	<ol style="list-style-type: none"> a. Applying for research funds. b. Use of lab facilities, equipment, and research assistants to experiment and analyze results. c. Participating in workshop(s) to provide training to students/research assistants to get hands on experience about the new techniques. d. Involvement in collaboration with other renowned national and international research universities/organizations in potential locations for our students to continue their research through short-term student exchange programs.

Research Area II: Prevalence and Mechanism of Antibiotic Resistance in Clinical and Environmental Samples	
Priorities	<ol style="list-style-type: none"> 2.1 Decipher the molecular and biochemical mechanisms of antibiotic resistance in different clinical and environmental samples using genomics and transcriptomics. 2.2 Study of mutations and genetic factors contributing to antibiotic resistance to develop targeted therapies.

	<p>2.3 Explore how resistant genes spread among bacteria in clinical settings, communities, and environmental reservoirs.</p> <p>2.4 Identification of novel antibiotics against antibiotic-resistant bacteria using silkworm larvae as an animal model.</p> <p>2.5 Elucidate the role of environmental factors in the development and spread of antibiotic resistance.</p> <p>2.6 Investigate and identify new classes of antibiotics or alternative antimicrobial therapies to combat resistance.</p>
Expected outcomes	<ul style="list-style-type: none"> • Provide insights of therapeutic measures to control the overuse of antibiotics as well as to reduce the emergence of drug resistant strains. • Students' employment as research assistants in North South University and other esteemed research universities/organizations to enhance research and resources to maximize public health benefit. • Identification and commercialization of novel antibiotics to treat infections caused by antibiotic-resistant pathogenic bacteria. • Publications in SCOPUS-indexed journal and conference presentations/proceedings.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Applying for research funds. • Use of existing lab facilities and resources. • Increase collaboration with other renowned research universities/organizations in potential locations for our students to continue their research through short-term student exchange programs. • Major collaborators, <ul style="list-style-type: none"> • Bangladesh Sericulture Research and Training Institute (BSRTI) of Rajshahi • Center for Advanced Research (CARS), University of Dhaka • Dhaka Shishu Hospital • National Institute of Biotechnology • Participating in workshop(s) to provide training to students/research assistants to get hands on experience about the new techniques. • Collaboration with national and international organizations.

Research Area III: Biocontrol and Bioremediation

Priorities	<p>3.1 Biocontrol of mosquitoes and other pest insects of Bangladesh using entomopathogenic (insect-killing) fungi and nematodes isolated from soils of Bangladesh.</p> <p>3.2 Isolation and characterization of chromium-metabolizing bacteria from tannery affluent for bioremediation of chromium-contaminated environment in Bangladesh.</p> <p>3.3 Develop a bacteriophage cocktail to clean the surfaces of the hospitals to</p>
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	<p>reduce the number of hospitals acquired (nosocomial) multi-drug resistant (MDR) bacterial infections.</p> <p>3.4 Removal of arsenic from farmland soil by genetically modified microorganisms and increase rice production.</p> <p>3.5 Identify and characterize halotolerant bacteria and their potential for industrial wastewater management.</p>
Expected outcomes	<p>Anticipated social impacts:</p> <p>The research results might help in reducing the spread of dengue, a disease that is affecting Bangladeshi people in recent years at an unprecedented level. The research results might also help in reducing the level of chromium (III) as an environmental pollutant, managing industrial wastewater, combating infections with MDR bacteria, reducing arsenic level from the environment.</p> <p>Research impacts:</p> <ul style="list-style-type: none"> • Identification and commercialization of novel bio-pesticides to control mosquito and other pest insects of Bangladesh. • International/National Publications. • Conference presentations. • Increased collaboration with National and International organizations. • The employability of NSU students will be increased upon achieving the research goals.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Applying for funds from national and international bodies • Use of lab facilities to test and analyze results. • Collaboration with <ul style="list-style-type: none"> • Dept. of Zoology, Jahangirnagar University • Bangladesh Sericulture Research and Training Institute (BSRTI) of Rajshahi • Collaboration with international research institutes.

Research Area IV: Food Safety and Security

Priorities	<p>4.1 To evaluate the risk assessment of chemical contaminants (heavy metal and pesticide residues) and presence of pathogens and their AMR pattern in market vegetables of Dhaka city.</p> <p>4.2 Characterization of biochemical Components of locally available ginger (<i>Zingiber officinale</i>) and its use against food spoilage microorganism.</p> <p>4.3 The pledge of microbe- and plant-derived biological agents to defeat pathogenic and spoilage bacterial biofilms concerning food industries.</p>
Expected outcomes	<ul style="list-style-type: none"> • Implementation of preventive measures to ensure the safety of the food products. • Control of foodborne diseases and introduction of preventive measures to reduce the foodborne incidence by the regulatory authorities. • Open multiple avenues in the field of food microbiology to ensure food

	<p>safety.</p> <ul style="list-style-type: none"> • Nationally, the farmers and others, directly and indirectly involved in every stage of food preparation to consumption might be educated about food hygiene by providing therapeutic decisions obtained from such study. • Metagenomic study of novel beneficiary microorganisms • Antibiofilm mechanism of novel beneficiary microorganisms • Microscopic investigation of the pathogenic bacterial biofilm inhibition • The research results will be published in peer-reviewed SCOPUS-indexed journals.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Applied for research fund and received the grant • Collaboration with local organizations, the National Institute of Biotechnology (NIB), and international research institutes • Arrangement and participation in the workshop(s) to train students/research assistants to get hands-on experience with the new food safety techniques. • Participation in different national and international food safety conferences. • Use of lab facilities, equipment, and research assistants to experiment and analyze results • Allocate funds for the acquisition and maintenance of essential laboratory equipment, purchasing different foods and food-processing surface coupons, bacterial growth media, freeze-dryer, spectrophotometer, and analytical instruments for the physiochemical study of foods.

Research Area V: Disease Pathogenesis and Host-Pathogen Interactions

Priorities	<p>5.1 Identification of novel pathogens- Explore and identify emerging pathogens to anticipate and prepare for potential disease outbreaks.</p> <p>5.2 Mechanisms of pathogenesis- Investigate the molecular and cellular mechanisms by which pathogens cause diseases, providing insights into potential therapeutic targets.</p> <p>5.3 Host Immune Response Profiling- Understand the host immune response to various pathogens, enabling the development of immunomodulatory strategies for disease control.</p> <p>5.4 Omics (Genomics, Proteomics, Metabolomics) Analysis- Conduct comprehensive genomic and proteomic analyses to unravel the genetic basis of pathogenicity and identify host factors influencing susceptibility.</p> <p>5.5 Host-Pathogen Interactions- Explore interactions between pathogens and hosts, addressing long-term health implications; Explore the impact of host microbiomes on disease outcomes and understand how pathogens interact with the microbiome.</p>
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	<p>5.6 Epidemiological surveillance- Establish robust surveillance systems to monitor disease prevalence, transmission dynamics, and the emergence of new infectious agents.</p> <p>5.7 One Health Approaches- Embrace interdisciplinary research that considers the interconnectedness of human, animal, and environmental health to combat zoonotic diseases.</p>
Expected outcomes	<p>Anticipated social impacts with reference to Health status and Health Service:</p> <ol style="list-style-type: none"> The study results will contribute to improvements of health status in Bangladeshi population by following appropriate interventions, preventive strategies that will reduce morbidity and mortality. The results of the study will validate the establishment of Molecular Biology Techniques including NGS technology as one the sustainable technology in Clinical Diagnostic Services in Bangladesh to measure and monitor health status against prevalent infectious diseases, vector borne diseases as well as non-communicable diseases. <p>Research Impacts:</p> <ol style="list-style-type: none"> The research results will be disseminated by publishing in peer-reviewed, high impact SCOPUS-indexed scientific journals. The study results will open the Molecular Biology Techniques including NGS technology to be used by all public and private level researchers in Bangladesh by taking research services by NGRI. Students' employment as research associate in North South University and other esteemed research universities/organizations to enhance research and resources to maximize public health benefit.
Strategies to achieve the goals	<ul style="list-style-type: none"> Applying for research funds Use of lab facilities, equipment, and research assistants to experiment and analyse results. Participating in workshop(s) to provide training to students/research assistants to get hands on experience about the new techniques. Involvement in collaboration with other renowned national and international research universities/organizations in potential locations for our students to continue their research through short-term student exchange programs.

Research Area VI: Computational and Experimental Approaches to Identify Therapeutic Compounds

Priorities	6.1 Therapeutic Compound Identification and Development: The process involves both computational and experimental approaches to accelerate drug development and improve therapeutic efficacy.
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	<p>6.2 Target Prioritization: Prioritize targets based on accessibility, druggability, and therapeutic potential.</p> <p>6.3 Computational Methods for Target Identification and Prioritization: Utilize computational methods like molecular modeling, protein-ligand docking, molecular dynamics (MD) simulation, DFT calculation, and network analysis.</p> <p>6.4 Computational Compound Screening: Employ computational methods to screen large compound libraries for potential drug candidates.</p> <p>6.5 Novel Compound Design and Synthesis: Design and synthesize novel compounds based on computational predictions and experimental data.</p> <p>6.6 Experimental Therapeutic Compound Discovery: Validate computational predictions and evaluate drug candidates' efficacy, safety, and properties through laboratory experiments.</p> <p>6.7 Therapeutic Candidate Testing: Test new therapies in cell cultures or isolated biochemical systems to assess their target activity and potential toxicity.</p>
Expected outcomes	<p>The ultimate outcome of this rigorous process is to identify therapeutic compounds that can interact with specific targets in the body, modulating their activity to treat diseases and improve the lives of millions of people around the world.</p> <p>Research Impacts:</p> <ol style="list-style-type: none"> a. The research findings will be widely disseminated through publication in peer-reviewed, high-impact SCOPUS-indexed scientific journals, ensuring broad access and impact within the scientific community. b. Organize training sessions and workshops for North South University (NSU) researchers and students. Share research findings through presentations at conferences, seminars, and workshops. c. Encourage and support collaborations between the public and private sectors, leveraging the expertise and resources of academia and industry to develop integrated drug discovery platforms.
Strategies to achieve the goals	<ol style="list-style-type: none"> I. Apply for budgetary resources to acquire essential chemicals, solvents, catalysts, and reagents required for the synthesis of new compounds and experimental assessments. II. Apply for funds for the procurement of computational software and resources for DFT calculations. III. Apply for funds for the acquisition and maintenance of essential laboratory equipment, including reactors, spectrometers, chromatography systems, and analytical instruments. IV. Promote collaboration with BCSIR, CU, and pharmaceutical companies among computational scientists, experimental biologists, and clinical researchers to bridge the gap between computational predictions and experimental validation.

	V. The project will facilitate the employment of students as research associates at North South University and other esteemed research universities and organizations, enhancing research capacity and resource allocation.
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C. Existing equipment in the department:

Sl. No.	Name of Laboratory	Name of Equipment	Units	Present Condition
01	SAC 408 (Research Lab-II)	Incubator	02	Functional
		Laminar Air Flow	01	Functional
		PCR Cabinet	01	Functional
		-40°C Freezer	01	Functional
		-20°C Freezer	01	Functional
		4°C Refrigerator	02	Functional
		Water Bath	01	Functional
		Electronic Balance	01	Functional
		Centrifuge	02	Functional
		Vortex Mixture	02	Functional
		Micropipette	04	Functional
Inoculation loop Incinerator	01	Functional		
02	SAC 409 (General Chemistry Lab-I)	Carbon dioxide Incubator	01	Not Installed
		Vortex Mixture	02	Functional
		Balance Machine	01	Functional
03	SAC 410A (Research Lab-I)	Autoclave Machine	01	Functional
		Laminar Air Flow	01	Functional
		Vortex Mixture	02	Functional
		4°C Refrigerator	03	Functional
		Dry Heat Sterilizer	01	Functional
04	SAC 410B (Mycology Lab)	Centrifuge	01	Functional
		Light Microscope	01	Functional
		Vortex Mixture	02	Functional
		4°C Refrigerator	01	Functional
05	SAC 412 (Molecular Biology Lab)	Biosafety Cabinet class II	01	Functional
		PCR Cabinet	01	Functional
		-20°C Freezer	01	Functional
		Refrigerator and Freezer Combination	01	Functional

		4°C Refrigerator	01	Functional
		Water Bath	01	Functional
		Electronic Balance	01	Functional
		Hotplate with Magnetic Stirrer	01	Functional
		pH Meter	01	Functional
		Centrifuge	01	Functional
		High-speed refrigerated Micro-centrifuge Machine	01	Functional
		Vortex Mixture	02	Functional
		Micropipette	24	Functional
		Dry Heat Sterilizer	01	Functional
		PCR Machin (Conventional)	02	Functional
		Spinner	01	Functional
		Heat Block (Dry bath)	01	Functional
		Thermo Shaker Heat Block	01	Functional
		Ice Maker	01	Functional
		Deionized Water Plant	01	Functional
		Gel Electrophoresis System	04	Functional
		UV Trans illuminator	02	Functional
		Spectrophotometer (old model)	01	Functional
		Precision Balance	01	Functional
		Heating Mantles	01	Functional
		Microwave oven	01	Functional
06	SAC 413 (Molecular Microbiology Lab)	Incubator	01	Functional
		Dry Heat Sterilizer	02	Functional
		Orbital Shaker	01	Functional
		Autoclave Machine	01	Functional
		Anaerobic Jar	02	Functional
		Biosafety Cabinet class II	01	Functional
		Bath Sonicator Machine	01	Functional
		Membrane Filtration Unit	01	Functional
		Light Microscope	03	Functional
		Refrigerator and Freezer Combination	01	Functional
		4°C Refrigerator	01	Functional
		Water Bath	01	Functional

		Electronic Balance	01	Functional
		Hotplate with Magnetic Stirrer	01	Functional
		Heat Block (Dry bath)	01	Functional
		Centrifuge	01	Functional
		Vortex Mixture	02	Functional
		Micropipette	06	Functional
		Inoculation loop Incinerator	01	Functional
		Blender Machine	01	Functional
07	SAC 414 (Biochemistry & Immunology Lab)	Biochemistry Analyzer	01	Functional
		4°C Refrigerator	02	Functional
		Water Bath	01	Functional
		Electronic Balance	02	Functional
		Distilled Water Plant	01	Functional
		High Precision Balance Machine	01	Functional
		Hotplate with Magnetic Stirrer	01	Functional
		pH Meter	01	Functional
		Centrifuge	03	Functional
		Vortex Mixture	01	Functional
		Micropipette	15	Functional
		Light Microscope	01	Functional
		Carbon dioxide Incubator	01	Not Installed
		SDS-PAGE System & Devices (including power supply)	01	Functional
		ELISA Reader	01	Functional
		Heating Mantles	02	Functional
		Liquid Nitrogen Storage Tank	01	Functional
		Rocker	01	Functional
08	SAC 415 (General Biology Lab)	Water Bath	01	Functional
		Distilled Water Plant	01	Functional
		4°C Refrigerator	01	Functional
		Light Microscope	03	Functional
09		Water bath	01	Functional
		Centrifuge	01	Functional

	SAC 415B (Biomolecular Chemistry Lab)	Vortex Mixture	01	Functional
		Balance Machine	01	Functional
		Hotplate with Magnetic Stirrer	01	Functional

D. Instruments/facilities required for Research Area I: Genomics

For sub-section 1.1 & 1.2

1. Shaking Microplate Incubator (01)
2. Dry Heat Incubator with shaking (24 X 1.5 ml Microcentrifuge tube) (01)
3. Vortex (02)
4. Real-time PCR (01)
5. Circulatory PCR Cabinet
6. Nanodrop (01)
7. Refrigerated hi-speed Centrifuges
8. Bioanalyzer

For sub-section 1.3 & 1.4

1. pH meter (01)
2. Distilled water plant (01)
3. Shaker incubator with temperature control (01)

For sub-section 1.4 & 1.5

1. Animal Cell culture facility (01)
2. Plant Tissue culture facility (01)
3. Vertical gel electrophoresis (02)
4. Western Blotting set up (02)
5. Ice machine (01)
6. Electric incinerator (Laboratory Purpose) (01)
7. Fluorescent microscope (01)
8. Refrigerator (-40°C) (02)
9. Horizontal gel electrophoresis set up (01)

Software required: (for sub-section 1.1, 1.2, 1.3, 1.4 & 1.5)

1. Primer 3
2. Melt curve analysis software
3. BASE-SPACE analysis software

Instruments/facilities required for research area II: Prevalence and Mechanism of Antibiotic Resistance in Clinical and Environmental Samples

For sub-section 2.1

1. Floor top Centrifuge Machine (Large capacity)
2. Tip Sonicator (01)

For sub-section 2.2

1. pH meter (01)
2. Online UPS (3kV) (01)

For sub-section 2.3

1. Refrigerator (-30°C) (01)

For sub-section 2.4

1. Horizontal gel electrophoresis set up (01)

For sub-section 2.5

1. Refrigerator (-30°C) (01)

Instruments/facilities required for Research Area III: Biocontrol and Bioremediation

1. Autoclave (Qty: 1 for the mycology lab in SAC410B)
2. Leica inverted microscope with camera (Qty: 1 for the mycology lab in SAC410B)
3. Low-temperature (10-42°C) incubator (Qty: 1 for the mycology lab in SAC410B)
4. Insectary Facility (Qty: 1 for rearing mosquitoes and other insects)
5. pH meter (Qty: 1 for the mycology lab in SAC410B)

Instruments/facilities required for Research Area IV: Food Safety and Security

For sub-section 4.2

1. Dryer incubator (Ecocell) (01)
2. Hot Air Oven (01)
3. Digital laboratory shaker (VS-8480 SF) (02)
4. pH meter (BP3001, Trans Instruments, Barat, Singapore) (01)
5. Ultra-high-speed centrifuge (temperature controlled) (01)
6. Different food-processing surface coupons (Glass beads, LDPE, HDPE, Stainless steel, etc.) (20 coupons/each)
7. Refrigerator (-80°C) (01)
8. Colorimeter (USP1792 UltraScan PRO, HunterLab Co., Reston, VA, USA) (01)

9. Texture analyzer (TA.XT PLUS, Godalming, UK) equipped with the SMS P/36R and SMS P/2 N probes (01)

Instruments/facilities required for Research Area V: Disease Pathogenesis and Host-Pathogen Interactions

1. Hot air oven
2. Autoclave Machine
3. MiliQ water plant
4. Sonicator
5. Nanodrop
6. Real time PCR
7. Confocal microscopy
8. Refrigerator (-80⁰C)
9. Ultra-high-speed centrifuge (temperature controlled)
10. Floortop centrifuge (for 50 ml or 15 ml tubes)
11. Digital overhead stirrer
12. Tissue Homogenizer
13. MACS Magnetic Separator
14. CLC Genomics Workbench (QiaGen)
15. Mammalian cell culture facility
16. Specific Pathogen-Free (SPF) Animal Research Facility

Instruments/facilities required for Research Area VI: Computational and Experimental Approaches to Identify Therapeutic Compounds

Molecular Modeling and Simulation Tools:

1. Supercomputer operating system
2. GROMACS 2023.3
3. Schrödinger 2023.3
4. AMBER22
5. NAMD Version 2.15 ALPHA
6. CHARMM v.48

Tools for Structural Biology and Bioinformatics:

1. PyMOL 2.5.5
2. Chimera1.17.3 or Chimera Alpha

3. VMD 1.9.4

Other specialized software:

1. Gaussian 16 and Gauss view 6
2. AutoDock

Synthetic Research Equipment:

1. Reaction Glass Vessels [Company: glassreactor.co]
2. Rotary Evaporator [Company: witeg GERMANY]
3. Distillation Apparatus [Company: garg INDIA]
4. Schlenk Line [Company: Chemglass Life Sciences]
5. Microwave synthesis reactor [Company: sineomicrowave]
6. UV-Vis [Biophlox]
7. TGA-DSC [Fisher Scientific/METTLER TOLEDO]
8. FT-IR [Glassco scientific and Analytical Company]
9. RAMAN [B&W Tek, Metrohm group company]
10. NMR [Bruker]
11. AAS [PinAAcle 900 series AA – PerkinElmer]
12. Mass spectrometers [Bimedis]
13. HPLC (High-Performance Liquid Chromatography) [PerkinELmer]
14. Heating and Cooling Devices: Such as hotplates, oil baths, and refrigeration units.
15. Vacuum Pumps [Cole-Parmer Germany]
16. Laboratory Glassware (flasks, beakers, and round-bottomed flasks) [PYREX® glass]
17. Filtration Equipment (Buchner funnels and filter flasks) [Sterlitech]
18. Magnetic Stirrers [Citotest Scientific Cp, Ltd]
19. Pyrex Coil Condenser
20. Ducted Fume Hood [Model: EFD-6B8, Manufacturer: ESCO Micro Pte Ltd., Singapore]

E. BMD Research Laboratory Requirements (for the next five years)

No.	Item	Justification	Current Status
1.	Mycology lab (800 sq. ft.)	To carry out mycology lab classes and fungal research work following biosafety protocols (for example, using a Class II Type A2 biosafety cabinet).	The current lab space in SAC410B (200 sq. ft. and separated from SAC410A with just a glass shield) is too small to install a biosafety cabinet, autoclave etc. and therefore, this lab space is required urgently.

			Students are working in an environment that is not ideal for fungal research.
2.	Computational Facility (500 sq. ft.) with 21 hi-tech computers	To carry out research and teaching on the efficacies of biological compounds or their derivatives with potential therapeutic effects. Computational simulation (including some AI-operated software) will be carried out to study the interaction of the cellular targets with the candidate compounds. The same facility can be used to carry out very recently developed software to analyze genes and their expression.	No such facility exists in the BMD. It is very important that we keep up with the pace of the changing world that is increasingly becoming heavily dependent on the use of AI.
3.	Protein purification lab (800 sq. ft.)	To carry out research and teaching the various techniques to purify different types of proteins. The lab should be equipped with HPLC, LC-MS, Chromatography refrigerators (cold cabinet) and other essential items to purify proteins.	No such facility exists in the BMD, although for a student to become a biochemist of international standard, they must know the basics of the art of protein purification.
4.	Animal care facility (800 sq. ft.)	To carry out research and teaching using the house mouse, <i>Mus musculus</i> . As a mammalian model, mouse is used throughout the world not only to understand the basic aspects of development but also to identify potential compounds with therapeutic effect against various diseases.	No such facility exists in the BMD, although teaching students on the various aspects of mammalian development and the use of mice in identification of compounds with therapeutic effect is very important.
5.	Insectary (800 sq. ft.)	To rear model insects like mosquitoes (<i>Aedes aegypti</i> and <i>Culex quinquefasciatus</i>), fruit fly (<i>Drosophila melanogaster</i>), silkworm (<i>Bombyx mori</i>). Mosquito research is important to identify biocontrol agents that	No such facility exists in the BMD. Dengue is affecting Bangladesh very severely in recent years and an effective biocontrol strategy is urgent because the use of chemical insecticides has proved to be useless. Controlling pest insects is

		will kill these insects responsible for diseases like dengue. <i>Drosophila</i> research is important to teach students the fundamentals of genetics and its usage to elucidate gene function. Silkworm research is important to screen for candidate compounds with therapeutic effects against infection, diabetes, hypercholesterolemia, etc.	also important to increase crop yield. Establishing an insectary will help students to learn the basic developmental processes and the genetics behind it since lots of mutant strains are available for <i>Drosophila</i> . Quantitative injections of compounds with therapeutic effect can also be examined in larvae of insects like silkworm that are larger in size.
6.	4 (Four) Lab officers	For the labs in rooms SAC408 (Research lab-II), SAC410A (Research lab-I), SAC410B (Mycology lab), SAC415B (Biomolecular Chemistry lab)	No lab officers are assigned in the rooms mentioned. Students are carrying out research work in these labs without the constant presence of a lab officer.

F. Publications in SCOPUS-indexed journals:

Projected numbers of publications/year in SCOPUS-indexed journals				
2024	2025	2026	2027	2028
43	46	49	52	55

G. Projected number of grants acquisitions by the department for the period 2024-2028

Year	Number of CTRG Grants	CTRG Grants Amount in lacs (BDT)	External Grants	National/International	Projected Amount in lacs BDT
2024	20	100		5	25
2025	21	105		7	35
2026	22	110		8	40
2027	25	125		9	45
2028	26	130		9	45
Total	114	570		38	190

NSU Global Health Institute (NGHI)

A. Summary of Research Priorities:

Research Area I:	Maternal, Child, and Adolescent Health
Research Area II:	Non-Communicable Diseases
Research Area III:	Mental Health and Quality of Life
Research Area IV:	Sexual, Reproductive Health and Family Planning
Research Area V:	Infectious Diseases (Emerging and re-emerging diseases)
Research Area VI:	Health Inequality
Research Area VII:	Occupational Health and Safety
Research Area VIII:	Environmental Health and Climate Change

B. Details of Research Priorities:

Research Area 1: Maternal, Child, and Adolescent Health	
Priorities	<ol style="list-style-type: none"> 1. Establish a network and collaboration with Bangladeshi and international research institutions and Universities to prevent maternal, childhood, and adolescent mortality and morbidities. 2. Design and conduct epidemiological studies to identify risk factors of neonatal and under-five child mortality and morbidities in Bangladesh 3. Design, implement, and evaluate low-cost, effective interventions to prevent maternal, child and adolescent mortality and morbidity in Bangladesh
Expected outcomes	<ul style="list-style-type: none"> • Collaboration with national and international research institutions and academia established. • High-quality publications in international journals • Maternal, child, and adolescent health in Bangladesh improve
Strategies to achieve the goals	<ul style="list-style-type: none"> • Research collaboration with national and international research institutions and academia • Establish a Public Health Research laboratory for data analysis and capacity building of students and faculty members

Research Area 2: Non-Communicable Diseases	
Priorities	<ol style="list-style-type: none"> 1. Establish a network and collaborate with National and international research institutions and Universities to conduct Non-Communicable Disease (NCDs) research to prevent and control NCDs. 2. Create and follow up a cohort to understand the burden and its risk factors. 3. Promote a healthy lifestyle, mainly targeting children, adolescents, and young adults, including students in schools and universities.

	<ol style="list-style-type: none"> 4. Undertake health system research to enhance effective healthcare delivery for Non-Communicable Disease (NCD) management, encompassing primary, secondary, and tertiary prevention. 5. Develop a comprehensive NCD research initiative focused on prevalent diseases such as cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases. 6. Partner with large tertiary-level hospitals/healthcare facilities to collect and analyze routine chronic disease management data. 7. Conduct clinical studies on the risk factors, prognostic factors, and management of NCDs.
Expected outcomes	<ul style="list-style-type: none"> • Publication of research findings in international peer-reviewed journals • A number of seminars and national conferences will be organized, followed by regional and international conference • Develop a regional network of NCD prevention and control
Strategies to achieve the goals	<ul style="list-style-type: none"> • Collaboration with national and international research institutions and academia • Involvement with government initiatives. • Capacity development of faculties • Enhance research culture and environment.

Research Area 3: Mental Health & Quality of Life

Priorities	<ol style="list-style-type: none"> 1. Establish a network and collaborate with Bangladeshi and international research institutions and Universities to conduct mental health and QoL research for the promotion of mental health and prevention and control of mental health illness. 2. Promote mental health prevention and management for the Bangladeshi population, especially for women, to prevent and control postpartum depression. 3. Promote mental health and QoL among children, adolescents, and young adults, especially school and university students. 4. Design and implement community-based mental health programs for the prevention and control of suicide. 5. Support the government of Bangladesh in expanding mental health services through research and collaboration.
Expected outcomes	<ul style="list-style-type: none"> • Established network and collaborative relationships with national and international research institutions and academia. • High-quality publications in international journals • Organization of seminars and national conferences, followed by regional and international conferences.

Strategies to achieve the goals	<ul style="list-style-type: none"> • Collaboration with national and international research institutions and academia • Involvement with government initiatives. • Capacity development of faculty members • Enhance the research environment.
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Research Area 4: Sexual, Reproductive Health and Family Planning	
Priorities	<ol style="list-style-type: none"> 1. Strengthen partnerships with national and international organizations focusing on Sexual and Reproductive health and rights (SRHR) and Family planning. 2. Women's Reproductive Health and Rights 3. Gender-Specific Diseases and Conditions 4. Gender-Based Violence and Abuse 5. Gender Identity and Sexual Health 6. Intersectionality 7. Foster collaboration with other departments within NSU. 8. Emphasize both Gender-specific and Gender-sensitive components in research. 9. Explore innovative, cost-effective approaches for surveys and evaluations.
Expected outcomes	<ul style="list-style-type: none"> • Successfully secured grants related to SRHR. • Improved Women's Health • Gender-Inclusive Healthcare • Empowerment of Women • Publish research findings in peer-reviewed journals. • Present research findings at international conferences • Publish blogs in reputed newspapers and websites. • Organize lunch and learn sessions with national and international experts.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Actively apply for grants related to SRHR • Establish a group for sharing updated research findings and grant opportunities. • Conduct training sessions for members on grant proposal and manuscript writing.

Research Area 5: Infectious Diseases (Emerging and re-emerging diseases)	
Priorities	<ol style="list-style-type: none"> 1. Establish a functional infectious disease research network throughout the South Asian region 2. Establish a collaborative network with government and non-government hospitals for infectious disease surveillance, like Dengue, Chikungunya, COVID-19, and any other emerging and re-emerging infectious diseases.

	3. Conduct epidemiologic investigations with prevention and control efforts to reduce the.
Expected outcomes	<ul style="list-style-type: none"> • Publication of research findings in international peer-reviewed journals • A number of seminars and national conferences will be organized, followed by regional and international conference • Develop a regional network of epidemic investigation
Strategies to achieve the goals	<ul style="list-style-type: none"> • Development of joint research proposal • Collaboration with national and international institutes • Increase research capacity by recruiting qualified faculty members and research staff (research associate and statistician)

Research Area 6: Health inequality

Priorities	<ol style="list-style-type: none"> 1. Gender and Health Disparities and Inequities 2. Gender Equity in Healthcare
Expected outcomes	<ul style="list-style-type: none"> • Gender Equality • Equitable Health Systems • Equitable Healthcare Access • Reduced Health Disparities
Strategies to achieve the goals	<ul style="list-style-type: none"> • Research collaboration with national and international research institutions and academia • Establish a Public Health Research laboratory for data analysis and capacity building of students and faculty members • Recruit faculty members with experience in qualitative research

Research Area 7: Occupational Health and Safety

Priorities	<ol style="list-style-type: none"> 1. Develop, gather, and provide reliable and relevant information, analysis, and tools to advance knowledge, raise awareness, and exchange occupational safety and health (OSH) information and good practice that will serve the needs of those involved in OSH. 2. Conduct occupational epidemiologic studies looking at workers exposed to various chemical, biological, or physical (e.g., noise, heat, radiation) agents to determine if the exposures result in the risk of adverse health outcomes in formal and non-formal sectors. 3. Establish a collaborative and functional research network with government and non-government organizations for occupational disease surveillance. 4. Establish a functional global OSH research network.
Expected outcomes	<ul style="list-style-type: none"> • Publication of research findings in international peer-reviewed journals • Organize several seminars, workshops, short courses, and conferences. • Develop a functional global OSH research network.

Strategies to achieve the goals	<ul style="list-style-type: none"> • Develop and submit a collaborative research proposal. • Collaboration with national and international research organizations • Increase research capacity by recruiting qualified faculty members and research staff (research associate and statistician)
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Research Area 8: Environmental Health and Climate Change	
Priorities	<ol style="list-style-type: none"> 1. Develop, gather, and provide reliable and relevant information, analysis, and tools to advance knowledge, raise awareness, and exchange environmental health and climate change information and good practices that will serve the needs of those affected in this area. 2. Conduct studies on environmental health and climate change, focusing at people exposed to various exposures that result in the risk of adverse health outcomes. 3. Establish a collaborative and functional research network with government and non-government organizations for environmental health and climate change issues. 4. Establish a functional global environmental health and climate change research network.
Expected outcomes	<ul style="list-style-type: none"> • Publication of research findings in international peer-reviewed journals. • Organize several seminars, workshops, short courses, and conferences. • Develop a functional global environmental health and climate change research network.
Strategies to achieve the goals	<ul style="list-style-type: none"> • Develop and submit a collaborative research proposal. • Collaboration with national and international research organizations. • Increase research capacity by recruiting qualified faculty members and research staff (research associate and statistician).

C. Existing Resources in the Department:

Sl. No.	Name of Resources	Name of Equipment
01	Faculty Member with relevant academic and professional background	Azaz Bin Sharif
02	Academic Staffs	Syed Sharaf Ahmed Chowdhury Sawsan Ahmed Bonhi
03	Research collaborations with national and international institutions and Universities	<ul style="list-style-type: none"> • BRAC • International Organization for Migration (IOM) • USAID • UKAID • Bandhu Social Welfare Foundation • Ze Project

D. Required resources/facilities to achieve the research goals:

1. Formalizing research groups involving fulltime NSU faculties
2. Formalizing faculty affiliations including visiting faculties, postdocs, and professorial fellows
3. Recruitment of research associates to facilitate research activities
4. Recruitment of research officer to facilitate research and administrative activities
5. Desktop computers for research work
6. Required furniture (chairs, computer tables) and teaching aids (microphone)
7. Authentic statistical software (SPSS, Stata, R, NVivo)
8. Some textbooks on epidemiology, biostatistics, research methods, and data analysis using different software for ready reference

E. Publications in SCOPUS-indexed journals:

Projected numbers of publications/year in SCOPUS-indexed journals				
2024	2025	2026	2027	2028
12	14	16	18	20

F. Projected number of grants acquisitions by the department for the period 2024-2028

Year	Number of CTRG/non-CTRG Grants	Grants Amount (BDT)	External Grants	Sources	Projected Amount in lacs BDT
2024	5	5,000,000.00	1	National/ International	10,000,000.00
2025	5	5,000,000.00	1	National/ International	10,000,000.00
2026	5	5,000,000.00	1	National/ International	10,000,000.00
2027	5	5,000,000.00	1	National/ International	10,000,000.00
2028	5	5,000,000.00	1	National/ International	10,000,000.00
Total	25	25,000,000.00	5	National/ International	50,000,000.00

NSU Genome Research Institute (NGRI)

A. Summary of Research Priorities:

- Research Area I: Genomic Epidemiology (MRC funded project in collaboration with University of Nottingham, UK, Queen's University Belfast, Cambridge, and IEDCR)
- Research Area II: Computational Genomics and Bioinformatics Tools
- Research Area III: Functional Genomics and Gene Regulation (Infrastructure development for acquiring additional grants)
- Research Area IV: Precision Medicine Initiatives (Proof of concept: funded by Social Science Research Council (SSRC), Planning Division, Ministry of Govt. Republic of Bangladesh)
- Research Area V: Epigenetics and Disease Susceptibility
- Research Area VI: Population Genetics and Evolutionary Genomics
- Research Area VII: Biobanking and Genetic Resource Management (NIH funded in collaboration with University of California Berkeley)
- Research Area VIII: Global Collaborations and Capacity Building (focusing on H5N1 and other viral genomic projects)

Advancing Sustainable Development through Genomic Research in Bangladesh:

The outlined genomic research projects in Bangladesh significantly contribute to multiple United Nations Sustainable Development Goals (SDGs). By enhancing genomic epidemiology and precision medicine, these initiatives support SDG 3 (Good Health and Well-being) through improved disease management and health care innovations. The development of computational tools and biobanking infrastructure aligns with SDG 9 (Industry, Innovation and Infrastructure), promoting technological advancements and economic growth. Capacity building and international collaborations, crucial components of these projects, address SDG 4 (Quality Education) by enhancing scientific education and SDG 17 (Partnerships for the Goals) through fostering global partnerships. While not directly targeting poverty, these research areas indirectly aid in poverty alleviation (SDG 1) by improving health outcomes and economic opportunities, thus contributing to a more stable and prosperous society. Through these diverse impacts, the research initiatives aim to meet a broad spectrum of SDGs, showcasing the integral role of genomic sciences in advancing global development agendas.

B. Details of Research Priorities:

Research Area I: Genomic Epidemiology

Priorities:

- Conduct genome sequencing during disease outbreaks to identify and trace pathogens.
- Collaborate with health organizations for monitoring and surveillance.
- Utilize computational models to analyze genomic data and forecast disease trajectories.
- Organize training on genomic epidemiology techniques and tools.

Expected outcomes:

- Establishment of a cutting-edge genomic epidemiology laboratory.
- Increased SCOPUS-indexed publications.
- Strengthened international research collaborations.

Strategies to achieve the goals:

- Medical Research Council (MRC) UK: A grant of £1.6 million for AI research in discovering new drugs and therapies to tackle antibiotic-resistant infections. The MRC is a UK-based organization dedicated to improving human health through world-class medical research. - Collaborators: University of Nottingham, Queens University Belfast, and IEDCR
- Apply for grants focused on genomic research and public health.
- Foster university and global health organization partnerships.

Research Area II: Computational Genomics and Bioinformatics Tools

Priorities:

- Develop and improve software tools for genomic analysis.
- Provide comprehensive training in computational biology.
- Create a community of developers to support computational genomics.

Expected outcomes:

- Enhanced research capabilities in genomic analysis.
- Establishment of a bioinformatics center.

Strategies to achieve the goals:

- Secure funding for computational infrastructure.
- Form collaborations with tech companies and academic institutions.

Research Area III: Functional Genomics and Gene Regulation

Priorities:

- Employ CRISPR-Cas technology for targeted gene editing.
- Undertake bacteriophage research to identify new therapeutic targets.
- Facilitate the dissemination of gene editing advancements.

Expected outcomes:

- Breakthroughs in understanding gene function.
- Development of novel genetic interventions.

Strategies to achieve the goals:

- Invest in cutting-edge laboratory equipment for gene editing.
- Promote interdisciplinary research combining genomics and other sciences.

Research Area IV: Precision Medicine Initiatives

Priorities:

- Integrate CRISPR technology for gene therapy development.
- Perform clinical trials to evaluate gene and phage therapies.

Expected outcomes:

- Advancements in personalized medicine approaches.
- Implementation of new treatments in clinical settings.

Strategies to achieve the goals:

- Collaborate with medical institutions for clinical research.
- Establish a precision medicine research fund.

Research Area V: Epigenetics and Disease Susceptibility

Priorities:

- Examine the role of epigenetic modifications in disease.
- Investigate lifestyle factors impacting the epigenome.

Expected outcomes:

- Identification of epigenetic biomarkers for diseases.
- Public health initiatives informed by epigenetic research.

Strategies to achieve the goals:

- Encourage interdisciplinary studies combining epigenetics with public health.
- Engage in community outreach to translate research into practice.

- Research Area VI: Population Genetics and Evolutionary Genomics

Research Area VI: Population Genetics and Evolutionary Genomics

Priorities:

- Analyze genetic diversity and its implications for health.
- Study evolutionary biology in the context of medicine.

Expected outcomes:

- Contributions to the understanding of human evolution and health.
- Enhanced global reputation in evolutionary genomics.

Strategies to achieve the goals:

- Promote population genetic research projects.
- Host international symposiums on evolutionary medicine.

Research Area VII: Biobanking and Genetic Resource Management

Priorities:

- Establish a robust infrastructure for biobanking in collaboration with University of California Berkeley.
- Develop international standards for genetic sample management.

Expected outcomes:

- Creation of a comprehensive biobank for genomic research.
- Ethical guidelines established for biobanking practices.

Strategies to achieve the goals:

- Partner with global biobanks to share resources.
- Implement state-of-the-art facilities for sample storage and data management.

Research Area VIII: Global Collaborations and Capacity Building (focusing on H5N1 and other viral genomic projects)

Priorities:

- Strengthen international partnerships in genomic research, particularly focusing on H5N1 and other viral genomic projects.
- Collaborate with the University of Pittsburgh and other institutions for genomic analyses related to H5N1 viruses.
- Build capacity for genomic sciences in developing countries, leveraging expertise from inter-institutional collaborations.

Expected Outcomes:

- Enhanced global exchange of genomic knowledge.
- Increased collaboration with international partners like the University of Pittsburgh.
- Establishment of multi-institutional projects that lead to publications and advancements in genomics research.
- Increased number of trained genomic scientists worldwide.

Strategies to Achieve the Goals:

- Foster partnerships with institutions such as the University of Pittsburgh for international genomic projects.
- Promote inter-institutional research collaborations as initial projects, including H5N1 research.
- Organize joint training programs, workshops, and research symposiums to build capacity in genomic sciences globally.

C. Strengthening the Institute: A Strategic Plan for Organizational Growth and Success

To ensure the continued growth and success of the institute, several key steps must be undertaken. The current organizational structure, comprising only a Director and a few research officers, is functional but insufficient for the institute's expanding needs. To address this, we propose the following measures:

Advisory Board: Establishing an advisory board will provide valuable guidance and support, drawing on the expertise of seasoned professionals. This board can help steer the institute toward its goals and make informed decisions.

Operational Framework: We should develop comprehensive rules and procedures, taking cues from successful organizations such as the ICDDR. This framework will streamline our operations and enhance efficiency.

Faculty and Funding: Appointing fellows or faculty members capable of securing external grants is crucial. Their efforts will bring in additional resources, further supporting the institute's projects and initiatives.

Institutional Approval: Finally, obtaining approval from the UGC will solidify the institute's standing, ensuring its legitimacy and providing a foundation for continued growth.

By implementing these measures, we can strengthen the institute's organizational structure and position it for long-term success.

D. Existing equipment in the Institute:

Sl.	Name of Laboratory	Name of Equipment	Unit	Functional
1	NGRI	MiSeq Sequencing System	1	"
2	"	NanoDrop	1	"
3	"	Bioshake Shaker	1	"
4	"	Luminometer,Fluorometer, Absorbance Reader	1	"
5	"	Vortex	1	"
6	"	Mini personal Centrifuge	1	"
7	"	Table top centrifuge	1	"
8	"	Vertical Gel Electrophoresis	1	"
9	"	On-Line UPS-3KVA	1	"
10	"	96 well Magnetic stand	1	"
11	"	Heat Block with 1.5 ml block	1	"
12	"	Biological safety cabinets	1	"
13	"	PCR Workstation	1	"
14	"	02 µl single channel pipettes	1	"
15	"	10 µl single channel pipettes	1	"
16	"	20 µl single channel pipettes	1	"
17	"	100 µl single channel pipettes	1	"
18	"	200 µl single channel pipettes	1	"
19	"	1000 µl single channel pipettes	1	"
20	"	10 µl multichannel pipettes	1	"
21	"	20 µl multichannel pipettes	1	"
22	"	200 µl multichannel pipettes	1	"
23	"	Laboratory Freezer/Biomedical Freezer	1	"
24	"	Biomedical Refrigerator	1	"
25	"	Real time PCR	1	"
26	"	Ultra-low temperature -86°C freezer	1	"
27	"	HP L J M506dn printer	1	"
28	"	MiniAmp Thermal Cycler	1	"
29	"	Micro Centrifuge	2	"
30	"	Computer, Core i3 18.5" Optiplex3060 MT	1	"
31	"	Refrigerator, 321 L	2	"
32	"	Refrigerator, 250 L	2	"
33	"	Horizontal electrophoresis System	1	"

Sl.	Name of Laboratory	Name of Equipment	Unit	Functional
34	"	Sharp Micro oven R-72A1(SM)V	1	"
35	"	HP 24f 24"HD Monitor	1	"
36	"	Brand Computer core i3 18.5" 3050 MT	1	"
37	"	Computer, Core i7 24 " Monitor	1	"
38	"	Micropipettes 0.1-2.5µl	1	"
39	"	Micropipettes 0.5-10 µl	3	"
40	"	Micropipettes 10-100 µl	1	"
41	"	Micropipettes 0.5-10 µl	1	"
42	"	Micropipettes 10-100 µl	3	"
43	"	Micropipettes 100-1000 µl	2	"
44	"	Computer, Core i3 18.5" Vostro 388 MT	1	"
45	"	Thermal Cycler (PCR system)	1	"
46	"	Incubator	1	"
47	"	Drying Oven	1	"
48	"	Horizontal electrophoresis systems	1	"
49	"	TruBlue 2 Blue/White Transilluminator	1	"
50	"	Orbital Shaker	1	"
51	"	Multipurpose portable balance	1	"
52	"	3 feet PCR Cabinet/Laminar air flow	1	"
53	"	Singer Microwave Oven	1	"
54	"	Elisa Microwell Auto Wash/LS5165000000	1	"
55	"	Omnipette 8-Channel Micropipette	1	"
56	"	20-200 µl Cat#CV8-200	1	"
57	"	Omnipette Single Channel Micropipette	1	"
58	"	Omnipette Single Channel Micropipette	1	"
59	"	20-200 µl Cat# CV200	1	"
60	"	Corning 20-200µl Lamda 8 Channel Cat#6059	1	"
61	"	Omnipette Single Channel Micropipette	1	"
62	"	Corning 30-300µl Lamda 8 Channel Cat#6060	1	"
63	"	Corning LSE digital water Bath	1	"
64	"	Distilled Water plant	1	"
65	"	Micropipette (2-20µl)	1	"
66	"	Micropipette (20-200µl)	1	"
67	"	Haier Freezer (-40)	2	"

Sl.	Name of Laboratory	Name of Equipment	Unit	Functional
68	"	Walton Flat Freezer	1	"
69	"	Singer Flat Freezer	1	"
70	"	Digital autoclave	1	"
71	"	Refrigerated centrifuge	1	Not Installed

E. Instruments/facilities required for Research:

Sl.	Name of Laboratory	Name of Equipment	Unit
1	NGRI	NextSeq2000 / Promethion	1
2	"	VITEK® 2	1
3	"	Shaker Incubator with temperature control	1
4	"	SDS-page	1
5	"	Cell culture facility	1
6	"	Electric incinerator (Laboratory Purpose)	1
7	"	Fluorescent microscope	1
8	"	Horizontal gel electrophoresis set up	1
9	"	Ice machine	1
10	"	Distilled water plant	1
11	"	Floor top Centrifuge Machine (Large capacity)	1
12	"	Shaking Microplate Incubator	1
13	"	Bioreactors	1
14	"	Tip Sonicator	1
15	"	HQ40D Portable Multi Meter	1
16	"	Vortex	1
17	"	Vertical gel electrophoresis	1
18	"	Vacuum Filtration system	1
19	"	Digital overhead stirrer	1
20	"	Multiposition magnetic Stirrer with heating	1
21	"	Ultra-high-speed centrifuge (temperature controlled)	1
22	"	Heating Mantles Analog	1
23	"	Laminar air flow	1
24	"	Dry Block heating with cooling	1
25	"	Precision Balances	1
26	"	PH Meter	1
27	"	Mini Centrifuge	1
28	"	High performance computer (4 CPU Nodes (Dual Intel Xeon Gold 6330, 256 GB RAM each), 3 GPU Nodes (Dual Intel Xeon Gold 6330, 256 GB RAM each, 2x NVIDIA A40	1

Sl.	Name of Laboratory	Name of Equipment	Unit
		GPUs per node), Networking Equipment, Storage Solutions, Racks and Power Supplies, Cooling Systems	
29	"	Digital Droplet PCR - Biorad	1
30	"	Flow cytometry	1
31	"	Gel-filtration chromatography / Ion-exchange chromatography unit	1
32	"	Robotic Liquid Handler	1
33	"	Bioreactor	1
34	"	CO2 incubator	1
35	"	anaerobic chamber	1
36	"	Minion nanopore device	1
37	"	Consumables for Microbiology, Molecular Biology and Cell Biology Research Activities	

F. Publications in SCOPUS-indexed journals:

Projected numbers of publications/year in SCOPUS-indexed journals*				
2024	2025	2026	2027	2028
12	15	20	25	30

* This depends on the advancement of infrastructure and the acquisition of manpower.

G. Projected number of grants acquisitions by the NGRI for the period 2024-2028

Year	Number of CTRG Grants	CTRG Grants Amount in lacs (BDT)	External Grants	National/ International	Projected Amount in lacs BDT
2024 - 2026	02	20	04	02/04	100
2026 - 2028	02	20	04	02/02	300

School of Humanities and Social Sciences

Strategic Research Plan 2024-2028

SHSS Vision and Mission

Vision

The vision of the SHSS is to become an excellent center of higher education in humanities and social sciences in the country and in the region of South Asia. The School of Humanities and Social Sciences envisions setting new heights of academic and professional standards in liberal arts and social sciences education in the twenty-first century.

Mission

School of Humanities and Social Sciences sets upon itself two-fold tasks of providing a broad-based foundational education in liberal arts, humanities and social sciences to NSU undergraduates, and producing academically sound and professionally competent graduates in specific areas of liberal arts and social sciences.

Our mission is to promote teaching and learning, scholarship and research, innovative academic curriculum, and pedagogical development in such related fields as English and Modern Languages, politics, sociology, anthropology, gender, philosophy, history, law, and current affairs in its curriculum. We are committed to creating and sustaining the conditions that will enable our students to experience a transformative educational journey that is intellectually challenging, socially, culturally and personally rewarding.

The courses offered by the School are designed to show students how human societies—in terms of structure and dynamics respond to crises, interact with foreign cultures, and how citizens' daily lives are changed over time. The goal is to put our present society into a global and historical context, to cultivate students' intellectual curiosity and to elevate their level of aspirations.

SHSS Broad Strategic Research Priorities 2024 – 2028

Brief Introduction

SHSS consists of four academic departments and an institute – the Department of English and Modern Languages (DEML), Department of Political Science and Sociology (PSS), Department of History and Philosophy (DHP), and Department of Law (DL). The only institute currently operating under SHSS is South Asian Institute of Policy and Governance (SIPG). The PSS and SIPG, however, function as twin academic units, as there are significant teaching and research overlapping between them. The total number of permanent faculty members of SHSS currently stands at 82 (DEML: 32, PSS: 26, DHP: 14, and DL: 10) and over 50% of them are lecturers and senior lecturers. Student enrolments are going up at an exponential rate every semester and every academic year (for example, total student/course enrolments in 2023 were 30,680). The obvious outcome has been more teaching, less time for research and publications by SHSS faculty.

To boost research activities and increase research outputs by faculty members, SHSS, after extensive discussions involving chairs of the four departments, the Dean and School Research Coordinator, determined the following strategic research priorities for 2024 – 2028.

- Promotion of research and scholarship through collaborative interdisciplinary research (involving interested faculty members from across SHSS and other schools at NSU).
- Faculty research capacity-building through research workshops, monthly research talks, holding of conferences and seminars for free and productive academic exchanges, mentoring of junior faculty members by senior faculty members etc.
- Actively seeking, competing and winning institutional (NSU), inter-institutional and extramural/external research grants.
- Publications of research outputs in Scopus-indexed international refereed Q1 and Q2 journals (SHSS sets the target number at **200** for 2024 –2028).
- Creation of a faculty research expertise data bank at the School level.

The discussion meetings recommended the following policy measures to enable and enhance faculty research contributions and publications at SHSS:

- Appointment of permanent faculty at assistant, associate, and full professor levels on a priority basis.
- Appointment of contractual “Research Associates” to help faculty out with research (2 to 3 research associates for each Department every year).
- Provision of visiting scholars for each Department and SIPG to promote NSU research and image abroad (terms and conditions plus expected benefits are to be negotiated separately per NSU policy).

SHSS Action Plans 2024 – 2028

The strategic research priorities 2024 – 2028, identified above, are contingent upon university level active support and approval. Below we present a series of charts/tables on SHSS’s needs, priorities, and required actions to implement the needs and priorities. Requests for budgetary allocations to support the action plans are not included in this report since each Department is now mandated to finalize and place its annual budget to the NSU authority through the SHSS Dean’s office.

Additionally, a separate proposal and an estimated budget for the creation of a faculty expertise data bank would be placed for approval later. The Dean of SHSS would take the initiatives to construct the web-based data bank.

SHSS Faculty Recruitment Plan 2024 – 2028 (Department-wise):

Departments	Years (Faculty recruitments at all levels)					
	2024	2025	2026	2027	2028	Total
DEML	6	6	5	4	4	25
PSS + SIPG	5	5	5	5	5	25
DHP	4	4	4	4	4	20
DL	3	5	4	4	4	20
SHSS Total						90

Appointments of Contractual Research Associates

Departments	Years (number of contractual Research Associates each year for each department, not exceeding 3 in any year)					
	2024	2025	2026	2027	2028	Total
DEML	2	3	3	3	3	14
PSS	2	3	3	3	3	14
DHP	1	2	3	3	3	12
DL	1	2	3	3	3	12
SHSS Total						52

Establishment of New Research Centers & Publication of Journals (2024 – 2028):

Departments	Research Centers	Labs	Journals
DEML	3	2	1
PSS	1	-	-
DHP	2	1	-
DL	1	-	1
SIPG	1	-	1

Visiting Scholars/Fellows Program (breakdown of numbers of scholars/fellows for each Department each year)

Departments	Years (at least 1 visiting scholar for each department every year)					
	2024	2025	2026	2027	2028	Total
DEML	1	1	1	1	1	5
PSS	1	1	1	1	1	5
DHP	1	1	1	1	1	5
DL	1	1	1	1	1	5
SIPG	1	1	1	1	1	5
SHSS Total						25

International Conferences/Seminars/Research Talks/Workshops/Webinars

Departments	Int'l Conferences	Seminars	Research Talks	Workshops	Webinars
DEML	5	10	10	10	25
PSS + SIPG	5	15	15	8	30
DHP	3	12	10	5	10
DL	3	10	12	7	12

In lieu of a conclusion: The strategic research priorities and action plans 2024 – 2028, set forth in this report, constitute a road map to elevate the research stature of SHSS in the next five years. SHSS academic leaders and faculty members would expect maximum cooperation and all-out support from the NSU authority to embark on this robust research journey in line with NSU’s ambitious but realizable goals of making it one of the best sites of higher education and research in Asia.

Department of English and Modern Languages

Research Mission Statement

- To encourage, support, and enhance research excellence in the department by inspiring and challenging members of the faculty to push the boundaries in both the advancement and creation of knowledge in literature, linguistics, and TESOL.
- To create the next generation of thinkers in the area of language and literary studies in Bangladesh.
- To partner with the international community to translate knowledge and discoveries into tangible benefits for society.

Research Vision Statement

- To be the premier research center in literature, linguistics and TESOL in the country, and an important member and key partner in the region and the world

Research Plan and 5-year Targets:

- Every faculty member will have a minimum of 3 publications over a period of 5 years. The advisory committee will decide on the acceptability of the peer-reviewed journals.
- Faculty member will be encouraged to pursue the highest degree in their respective fields.
- UGC, World Bank, and TESOL related research grants will be explored. Scholarships and postdoctoral programs can also be explored.
- Establishing a center for advanced studies in Language, Literature and TESOL by 2028. This center will promote research, publications, and national and international collaborations. The areas of focus for the center will be: Bangladeshi writing in English, Translations, Teaching of English to Speakers of Bangla (TESB), and establishing the Dhaka School of Thought in Language Studies.

Dissemination:

- International Conferences.
- The department will continue to arrange monthly discourse series lectures, and Colloquia, reaching out to scholars from home and abroad. It will also reach out to top students of the country through events like the Language League.
- MoU's with international institutions will be explored, and collaboration with Stony Brook University, NY, Yunnan University China, Goethe Institute Alliance Francaise, Sapienza University of Rome, Link Staff Co., The University of Press Limited (UPL) and CUC will continue.

Research Facilities

The existing and planned research facilities (institutes, centers, groups, etc.) of the department are summarized in the following table.

Planned Research Facilities

Facility Type	Planned (2024-2028)
Center	<ul style="list-style-type: none"> • Writing Center (by 2024) • Center for Translation Studies 2026 • Center for Advanced Studies in Language, Literature and Culture (by 2028)
Group	<ul style="list-style-type: none"> • International Collaboration (by year 2021) • TBA...(by year 2025) • TBA (by year 2026) • TBA...(by year 2028)
Research Lab	<ul style="list-style-type: none"> • Recording lab for Advanced Language Research ...(by year 2028) • (by year ...) • (by year ...)
Hiring Researchers	<ul style="list-style-type: none"> • Scholar-in-Residence... (by 2025) • Visiting Faculty (by year ...2026) • (by year ...)
Research Collaboration	<ul style="list-style-type: none"> • Oklahoma City University (by 2027) • University of New Mexico (by 2027)

Faculty Recruitment Growth

The following table shows the current and planned numbers of faculty members of the department. Figure 3 shows the planned growth of full-time faculty members of the department.

Current and Planned Number of Faculty Members

No. of Faculty Members		Total	Planned				
			2024	2025	2026	2027	2028
Full-time	Professor	1	2	4	5	5	6
	Associate Professor	1	3	3	4	5	6
	Assistant Professor	8	9	12	13	15	15
	Senior Lecturer	16	16	17	18	19	20
	Lecturer	10	12	12	13	13	13
	Junior Lecturer	5	5	4	3	2	2
Total Full-time Faculty		41	47	52	56	59	62
Full-time Ph.D. Faculty		9	13	18	21	24	26
Total Part-time/Guest Faculty		39	34	30	26	22	16
Total Faculty Members		80	81	82	82	81	78
Visiting Professor /scholar /fellows		Honorarium, terms and conditions as per NSU Recruitment Policy					

Laboratory Facilities

The existing and planned (2024 - 2028) laboratory facilities of the department are shown in the following tables.

Planned Laboratory Facilities

Planned Laboratories: Type, Numbers (2024-2028)
Language Lab
Research Lab
Writing Center
Center for Advanced Studies in Language, Literature and Culture
Center for Translation Studies

Planned Research Activities of the Department (2024 - 2028)

Type	2024	2025	2026	2027	2028
Total Peer-reviewed Journal/Conference publications (nos.)	20	21	22	24	26
Scopus-indexed Journal /Conference publications (nos.)	13	14	15	16	17
Book/Book Chapters (nos.)	4	6	7	8	9
NSU Research Grants (Million BDT) Budget	1	2.3	0.3	3	1.3
External Research Grants (Million BDT) Budget	0.5	1	0	3.5	3.5
Establishment of Research Laboratory/ Center/ Institute (nos.)	1	0	1	0	1
Research Collaboration with National/ International universities/ research institutes (nos.)	4	4	4	4	4
Research workshop/ seminar/ conference (nos.)	11	12	13	13	13
Research workshop/ seminar/ conference (Budget in Million BDT)	2	2.5	3	3.5	4

(Annual) Strategic Plan/ Business Plan/Action plan for the November 2024 to November 2028
Department of English & Modern Languages
North South University

A	B	C	D	E	F	G	H	I	J	K	L	M	N
Sl.	Area of intervention (Criteria)	Target/ goal	SAR & EPRR recommendation	Current Situation	Proposed intervention	Time line	Fund required? (Yes/ No)	Proposed amount	Sources of fund	Offices/ Persons responsible	Performance indicator	Verification method	Roadblock/ overcome/ remarks
1	Governance	1. Review and improve the existing strategic plan for DEML.	1. EPRR team had recommended that the Department provide different key performance indicators (KPI) with a time frame for its strategic plan.	1. DEML has completed the duration of its past strategic plan (2019-2023) and is in the process of finalizing its strategic plan for next 5 years (2024-2028).	1. - Form a 3-member 'DEML strategic plan' committee'. - The new committee may review the successful implementation of this plan halfway through the 4-yr period.	1. November 2023 - January 2025	1. Yes (for meetings and refreshments, and external members and reviewers, if and when needed)	1. 300000 BDT	1. NSU	1. Chair/ Committee/ invitees/ faculty/ staff	1. - DEML strategic plan committee	1. - Improve strategic plan for DEML	1. If there is no honorarium for the committee members, they will not be interested to work on the improvement of the plan. This can be arranged in the form of a course release or an honorarium.
		2. More space has been allocated for the purpose of archiving material. Discussions have been ongoing to establish a center for archives at NSU.	2. Since the implementation of the last strategic plan, we have found that documentation and the data retrieval process has been strengthened immensely in DEML.	2. More space is required for proper archiving at DEML. If the center for archives is established. Many DEML documents can be shifted to the archive.	2. - Existing store room may be developed as a digital archive. - More training is required for office staff and the record keeper(s).	3. Dec 2024 – DEC 2026	2. Yes	2. 500000 BDT	2. NSU	2. Chair/ Dean/ Relevant officers from administration	2. - Form a 4-member committee (Chair, Dean, Project Director, Finance Director, Head of IT)	2. - Formal inaugural of the digital archive	2. - Funding will be a major obstacle.
		3. Form well-defined policy for research at DEML/ NSU.	3. NSU should have clear well-defined research policy.	3. Faculty members of DEML are research active. Between 2020-2022, the combined	3. - Reduce course load from 5 to 4 for every, assistant professor, senior lecturer, and	3. 1 January 2024 – 1 December 2025	3. - Yes	3. - 2100000 (twenty one lac taka only) 5 RA's for a year	3. - NSU, other	3. Chair, Dean, NSU authority, Discourse, Colloquium, and Research Coordinators, All DEML	3. - Formulation of specific policy	3. - increased number of research output in world-class peer-reviewed journals	3. - A reduction in course load may take time.

				<p>departmental output for peer-reviewed publications was 53. The Department secured a Fulbright ELF grant from the US State Department 2022-2023, In the last five years, faculty members secured research grants worth over 3 million BDT Faculty members presented numerous papers in conferences both locally and internationally. The Department hosted over 150 academic panel discussions, keynotes, seminars, etc.</p>	<p>lecturer. -- Reduce course load from 5 to 3 for every associate professor - Reduce course load from 5 to 2 for every professor. - Sabbatical leave for senior teachers for book publication. - Appoint 5 Full-time Research Associates for DEML - Semester leave with salary for faculty members for publication in well-reputed international journals approved by NSU. - Grant acquisition training workshops for DEML teachers. - Generously incentivize research</p>			RA's monthly salary: 35,000/-		faculty members			
2	Curriculum	1. Continue to update the curriculum according to UGC directives and international standards.	1. No recommendation has been issued since the submission of the last curriculum in 2022.	1. - A comprehensive MA in English curriculum, a BA in English Curriculum, and a BA in Bangla	1. - The Registrar's office has been requested to follow up with the UGC. This process will be repeated until	1. 1 Nov 2022 - 1 July 2024	1. Yes	1. 75000 BDT	1. NSU	1. Chair/Registrar/ All DEML faculty members	1. - UGC approval of the curriculum	1. - Degrees accepted by universities around the world.	1. - Delays by the UGC to approve the curriculum

			Curriculum have been submitted to UGC, after being approved by the Department Curriculum Committee, Academic Council, and Syndicate.	approval is granted by the UGC. -								
	2. Continue to update the IQAC approved template for the course outlines which will be followed by all faculty members.	2. The department has moved away from providing only content-based syllabus as recommended.	2. - At present the IQAC approved and Department vetted template is followed for each the course outlines. Students have access to the curriculum through the university website	2. - Continue to seek suggestions to improve the existing uniform course outline template through a series of workshops.	2. 1 Nov 2024	2. Yes	2. 50000 BDT	2. NSU	2. Chair/IQAC/ Coordinators/Faculty members	2. Improved uniform course outlines.	2. All instructors to follow improvements in the template when preparing their course outlines.	2. It may be difficult to fix a particular template across the three streams (Literature, Linguistics, and TESOL)
	3. Teachers will be trained.	3. We have found that teachers should receive training on curriculum design & development and teaching pedagogy.	3. New instructors are observed in class by experienced members of the faculty. Observations are reported and recorded. Opportunities and strategies for improvement are discussed.	3. - DEML arranges a series of seminars on relevant areas including curriculum design and development and teaching pedagogy. These are conducted by in house and external scholars and experts. However, more opportunities can be explored that may lead to improvement of	3. 1 NOV 2024 – 1 NOV 2028	Yes	3. 10,00,000 BDT	3. NSU/ other	3. In-house and external trainers. IQAC/OR/ DEML	3. Improved classroom teaching and research skills among new teachers.	3. Classroom observation.	3. - Because of heavy workload and time clashes teachers may not be able to participate in the seminars and workshops. - Obtaining funds can be an obstacle.

					research and teaching skills.								
3	Student admission ...	1. Make a new prospectus meeting international standards to attract more students.	1. Prospectus for students should be available.	1. There is a prospectus but it needs to be improved.	1. Form an editorial board that will review the current prospectus and create a new one as per the international standards.	1. Summer 2024	Yes	1. 100,000 BDT	1. NSU	Chair/ Proposed editorial board	1. The prospectus will be displayed in DEML.	1. The new prospectus	1. Faculty members already have a heavy workload. This will require considerable time and effort. Unavailability of funds might be an obstacle.
4	Physical facilities	1. Set up a writing center.	1. We have found that there is no writing center for the department.	1. A proposal for the writing center has already been accepted by the Academic Council. It will cater to the writing needs of students and teachers across disciplines.	1. Identify space for writing center. 2. Prepare yearly budget. 3. Bring in computers, furniture, and books for the library. 4. Seek approval from NSU authority.	1. Spring 2024 - Spring 2025	Yes	1. 10,00,000 BDT	1. NSU	1. NSU Authority, Chair DEML, Director WC-DEML Librarian, Project Director, Procurement Director	1. Identification of space 2. Budget 3. Computers, furniture, and books 4. Approval from the authority	1. A functional writing center	1. Funding and implementation
5	Teaching learning ...	1. Reduce class size. Increase floor space and number of classrooms	1. We have found that the class size is generally big.	1. Most of the classes particularly EAP courses and GEDs are too big for effective teaching.	1. DEML Chair/Director Admissions/Dean/PVC/NSU Authority need to reduce intake and improve student quality.	1. Spring 2024 - Spring 2028	N/A	N/A	N/A	1. DEML Chair/Director Admissions/Dean/PVC/NSU Authority	1. Reduced intake.	1. Reduced class size	1. - Difficult to hire qualified faculty members -Immediate Reduction in revenue due to low enrollment, which is challenging for a private institution. Securing alternative sources for funding
6	Student support	1. Ensure the participation	1. We have found that NSU DEML	1. No participation of	1. Form a committee from	1. Summer 2024	Yes	500,000 BDT	NSU	1. Chair/ Alumni	1. Establishment of the	1. Participation of the parties	1. Lack of enthusiasm from

		of DEML students in career fairs organized by NSU.	students do not participate in NSU career fairs.	DEML students in career fairs.	the Alumni Association and Faculty members. 2. Maintain liaison and invite organizations (educational institutions and media industry, for example) that will recruit DEML graduates. 3. Advertise the presence of the organizations.	2. Spring 2025				committee/	committee 2. Successful liaison with relevant organizations		the students and organizations
7	Staff ...	1. Non-academic staff will be trained. 2. Form criteria for the recognition of the performance award policy for the DEML non-academic staff.	1. We have found that non-academic staff should be provided with professional development. 2. We have found that no performance award policy is currently in practice.	1. Recently, IQAC has provided training to the non-academic staff at NSU. 2. There is no recognition of the performance of the DEML non-academic staff.	1. Identify and contact trainers to train the non-academic staff on a number of relevant tasks. 2. - Form a three-member committee consisting of the Dean, Chair and Admin Director. - The committee will review the performance of the non-academic staff. - Finalize the criteria for the award.	1. NOV 2024 - Nov 2026 2. Dec 2026	Yes Yes	100,000 BDT 400,000 BDT	NSU NSU	IQAC, NSU-Admin., Chair Dean	1. Trainer 2. Training programs for the non-academic staff 2. - Formation of the three-member committee - Draft criteria for the performance award 3. Final criteria document	1. Improvement of the professional skill of the DEML non-academic staff 2. Performance award ceremony	1. Lack of fund 2. Lack of the time of non-academic staff 3. Transfer of the personnel after receiving training 2. Administrative complications
8	Research ...	Addressed in 1.3											
9	Continuous improvement	1. Formal peer review system should be	1. SAR has observed that no formal peer review system is implanted for	1. There is a peer review system but it is not done on a regular basis	1. - Make a university-wide policy for peer	1. Spring 2026	Yes	1. 200,000 BDT	1. NSU	1. Academic Council/IQAC/Chair/Dean	1. Formation of the committee	1. Peer review policy	1. If there is no honorarium, faculty members will not be

	introduced, taking into account all the roadblocks faced by DEML.	evaluating a teacher by another independent teacher. So they recommend a formal peer review system at DEML.	because of the time constraints of the observers.	review system.								interested.
	2. Formal method to get feedback from stakeholders on curriculum and curriculum delivery should be established.	1. SAR has observed that No formal method is established to get the feedback from the stake holders other than current students. 2. Include QA as an agenda item annually in the department academic meeting	1. No formal method is established to get the feedback from the stake holders other than current students.	1. Form a 3 member QA Cell within DEML - Maintain liaison with the central IQAC - Organize annual feedback sessions with the stakeholders - Report the findings to the Chair - After careful consideration, the Chair will address crucial issues as parts of the QA agenda items during the following Spring term core faculty meetings.	Spring 2024 – Spring 2028	Yes	1. 5,00,000 BDT	1. NSU	1. Dean, Chair, IQAC, 3 member QA Cell	1. QA Cell formation 2. Regular annual workshops with all the stakeholders	1. Establishment of the 3 member QA Cell 2. Annual report to the Chair 3. Successful inclusion of QA as an agenda item in the mentioned Spring term core faculty meetings	1. Funding will be a major obstacle 2. Workload on the QA Cell members

Department of History and Philosophy

About the Department

As an academic unit of the School of Humanities and Social Sciences (SHSS), the Department of History and Philosophy (DHP) came into being on 1st January 2015. Since its inception, the department is catering GED courses to undergraduate students across North South University. Classes are organized to promote awareness in the domain of national and global history, along with the pursuit of developing the ethical and moral values of our students. Significant areas in history include national culture and heritage, the emergence of Bangladesh, world history, world civilization, and Islamic history. The philosophy cluster focuses on business ethics, visionary and moral thinking, and aspects of human psychology. Some full-time foreign faculty members have already served in the department, while one professor in Philosophy is continuing as Research Director of the NSU. Besides classroom teaching, faculty members are engaged in knowledge creation in their respective areas.

Vision

The Department of History and Philosophy aspires to be the Centre of Excellence based on historical and philosophical knowledge and research activities within Bangladesh and South Asia.

Mission

- The DHP is pursuing an inclusive approach towards a better understanding of the socio-economic and political history of Bangladesh and the South Asian region.
- Presenting innovative and scholarly research in applied history and philosophy that links up the past heritage, present realities, and future aspirations at the national and regional levels.
- The DHP is transforming NSU students to acquire global standards in terms of critical thinking and moral development.
- Providing basic knowledge to the students in liberal arts to help grow them as human capital with enlightenment, patriotism, ethical standard, and intellectual abilities.

Strategic Goals

The Department of History & Philosophy expects to hire more competent core faculty members in the future for its overall development. The learned faculty members will contribute to building the capacity of the department in both research and academic sphere.

The department is currently offering GED courses across the university and one Master's program in History and Asian Studies.

The department also intends to offer a minor degree in History and Philosophy for undergraduate students who are doing their major in Economics or English language and Literature in the near future.

Current Program

A summary of the Masters' program offered by the DHP at NSU is as follows:

Current Running Program of the Department

Program Details		Planned Program (2024-'28)
Program	Credit Hours / Duration	
Graduate Program: M.A. in History & International Affairs	36 Credits/ 2 Years	The program started its journey from Spring 2023

Students Growth

In 2015, the DHP offered courses to 4,620 students. Over the last five years, from 2019 to 2023, the DHP student enrollment steadily grew up to 19107 annually. The growths of the year-wise Enrolment in different courses are as follows:

Past & Current Enrolment of Students (2019-2023)

Program/Clusters	Year Enrolments GED Courses & MAHAS				
	2019	2020	2021	2022	2023
History	8161	11680	10471	8686	9802
Philosophy	5264	4611	4316	4398	4138
Psychology	1544	2816	3183	3804	4621
All GED Courses	14969	19107	17973	16888	18561
MA in History & Asian Studies (MAHAS)	-	-	-	-	08

Planned Enrolment of Students (2024-2028)

Program/Clusters	Year of Enrolments GED Courses & MAHAS				
	2024	2025	2026	2027	2028
History	10000	11000	12000	12250	12500
Philosophy	4500	4700	4900	5000	5200
Psychology	5000	5200	5300	5400	5500
All GED Courses	19,500	20,900	22,200	22,650	23,200
MA in History & Asian Studies (MAHAS)	15	20	30	40	50

Faculty Growth

The following table shows the current strength and planned recruitment of Faculty members of the DHP. The following table indicate the total number of faculty members those are serving in 2023 & the planned growth of full-time faculty members of the department as follows:

Current and Future Projection of the DHP Faculty Members

No. of Faculty Members		2023	Planned				
			2024	2025	2026	2027	2028
Full-time	Professor	03	03	03	04	05	05
	Professorial Fellow	01	01	01	01	01	01
	Associate Professor	00	01	01	02	02	02
	Assistant Professor	02	03	04	04	05	05
	Senior Lecturer	01	02	03	03	03	04
	Lecturer	06	07	08	09	10	10
	Junior Lecturer	01	01	01	01	01	01
Total Full-time Faculty		14	19	23	26	29	30
Full-time Ph.D. Faculty		6	9	11	13	15	15
Total Part-time / Guest Faculty		58	55	52	50	48	45
Total Faculty Members		72	74	75	76	77	75
Total Ph.D. Faculty		42	45	48	50	52	55

Laboratory Facilities

The Department of History & Philosophy (DHP) has been offering *PSY101L – Introduction to Psychology Lab* in regular classrooms since 2017. However specifically, no laboratories have been allocated for the lab course yet. We will propose the NSU authority to allocate at least one laboratory for PSY101L.

Existing and Planned Laboratory Facilities

Existing Laboratories: Course & Number of Sections	Planned Laboratories: Course, Number of Sections (2024-'28)
PSY101L – Psychology Lab: 60	PSY101L – Psychology Lab: 70

Research Mission

The Department of History and Philosophy (DHP) is equipped with faculty members specializing in diverse research fields that include local, national, and global perspectives. In line with the faculty members' interest, the department sets out some specific research areas in history and philosophy.

Research Priorities

As the Department of History & Philosophy (DHP) is catering GED courses mostly offered by the part-time faculty members, the current format does not reflect the department's research activities. Nevertheless, the existing and planned research activities of the full-time faculty members are summarized in the table below:

Existing and Planned Resource Persons for Research

Core Faculty	Existing	Planned (2024-'28)
	<ul style="list-style-type: none"> • Dr. Mahbubur Rahman • Dr. Sharif uddin Ahmed • Dr. Norman K. Swazo • Dr. Zerina Shabnaz Akkas • Dr. Saleh Md. Shahriar • Dr. Mushfiqul Anwar Siraji • Ms. Fahria Karim • Ms. Raihana Sharmin • Ms. Marzan Bintey Kamal 	Hiring new Researchers/Faculties <ul style="list-style-type: none"> • in line with the Vice Chancellor's goal for faculty recruitment
Research Collaborations	<ul style="list-style-type: none"> • University of Calcutta 	<ul style="list-style-type: none"> • United International University • Dhaka University • School of Oriental and African Studies, University of London • Northwest A&F University, Shaanxi • Renmin University of China, Beijing • Shanghai Normal University, Shanghai • Shandong University, Jinan • Monash University (Australia/Malaysia)

Research Activities

It may be mentioned here that only fourteen full-time faculty members are currently serving in the Department of History & Philosophy (DHP). The research activities of the DHP in the recent past are as follows:

Planned Research Activities of the Department (2024 - 2028)

Target Categories	Targets
Journal Articles	29
SCOPUS-indexed Journal Articles	5
Journal	1
Books	2
Book Chapters	8

Edited Books	3
Edited Volumes	0
Business Cases	N/A
International Conferences	3
Conference Presentations	40
Conference Proceedings	3
Policy briefs	N/A
Working Papers/ Presentations	15
Department Symposium/Seminars	12
Inter-institutional research collaborations (local)	5
Inter-institutional research collaborations with foreign universities/ Institutes	5
NSU research grants number	25
Extramural research grants	2
Establish new research labs or centers	1
Others	5

Five-Year Strategic Research Plan (2024-2028)

Establishment of two Research Centers

1. **Liberation War Research Center (LRC):** Proposal prepared, to be launched subject to funding in 2024
2. **Center for Human Wellbeing (CHW)** to be launched upon funding in 2026

Areas of Research Priorities:

History	Philosophy	Psychology
<ul style="list-style-type: none"> • Emergence of Bangladesh as a Sovereign Nation • Urban Development of Bangladesh – Prospects and Challenges • Checkered History of Democracy in Bangladesh • Implications of the Global Rise of China • Comparative Border Studies • Chittagong Hill Tracts' (CHT) Security Issues • Rohingya Refugee Crisis/Repatriation • Bengal Partition & Memory Studies 	<ul style="list-style-type: none"> • Medical Ethics • Contemporary European Philosophy • Application of Business Ethics: The Impact of Surveillance Capitalism • Comparative Religion • The Problem of Evil\ • Liberalism, Secularism and Humanism • Asian Philosophy: Confucianism 	<ul style="list-style-type: none"> • Mental health and Wellbeing • Cognitive Psychology • Psychology of immigrants and refugees • Psychology of Diversity and Inclusion • Organizational Psychology • Health Psychology

<ul style="list-style-type: none">• Urban and Subaltern Studies - South Asia• Ethnicity and Refugee Studies		
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Core faculty members will publish books and scopus-indexed journal articles on the above topics.

To accomplish the departmental strategic goals, the following specific strategies have also been adopted:

1. Enhance research activities							
Goal	Description	Result Indicator	Tactics	Responsible Person(s)	Timeline (by year)	Resource Needed	Status
1 (a)	Book: <i>Urban Development of Bangladesh – Prospects and Challenges</i>	It will help students and readers across the world to understand the gradual evolution of Bangladesh into an urban society from a rural based society	Core and Adjunct Faculty will be engaged in the Project	Dr. Sharif Uddin Ahmed and some specialist Core Faculty	2024-25	Both local and external funding will be sought	
1 (b)	Book: <i>Bangladesh: A Journey to Sovereign Nation State</i>	This book will work as a text for “Emergence of Bangladesh” course and establish NSU’s contribution to the Bangabandhu and liberation war studies.	Core and Adjunct faculty are engaged in this research	Dr. Kamal Abdul Naser Chowdhury, Honorary Fellow, Asif bin Ali, Lecturer and Dr. Abdus Samad, Adjunct Faculty, DHP	December 2024	Funding needed	Funding approved
1 (c)	Edited Book: <i>Rohingya Repatriation: An Abandoned or Achievable Agenda?</i>	It will contribute to theoretical understanding and provide policy input towards Rohingya Repatriation	Core, Adjunct and overseas faculties are engaged in this research	Co-editor: Dr. Mahbubur Rahman	2024-2025	-	Continuing

2. Enhance MAHAS enrolment with a view to increase graduate student research assistance							
Goal	Description	Result Indicator	Tactics	Responsible Person(s)	Timeline (by year)	Resource Needed	Status
2 (a)	Newly introduced MA in History & Asian Studies (MAHAS) program is still in its infancy. Thus, policies and infrastructures need to be built first in a more serious mode to make the program a success.	The program is still in its infancy and hence intake is just a few.	A wide range of publicity and campaigning has to be made highlighting the justification of the Course and its demand in the job market throughout the world.	Chair and Senior Faculty. As well the Public Relations Office of NSU.	2024	Funds for multifold campaigning	Major Campaign will start in 2024

2 (b)	Mass campaigning by visiting various institutions and making efforts to recruit. If necessary, teaching may be taken outside NSU	Mass campaigning through various platforms might increase enrolment. Reduction in fees or subsidy providing might also help enrolment.	Visiting Institutions and addressing senior students; Advertisements in the Newspapers and other media	DHP and Public Relations Office, NSU	January 2024 – January 2025	Funds needed for campaigning and advertisements	Will start soon.
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Department of Law

Faculty recruitment

The Department of Law plans to hire at least (3) three faculties (preferably with Ph.D. degree each year) for the next five years. Due to the direction of the Hon'ble Supreme Court of Bangladesh, the number of students enrolled each semester in the Bachelor of Laws program cannot be more than 75. Thus, the Department of Law is not anticipating a sudden rise in number of students in its LL.B Programme.

The following table provides the breakdown of the recruitment plan:

Year	Lecturer	Senior Lecturer	Assistant Professor	Associate Professor	Professor	Total
2024	0	0	1	1	1	3
2025	0	0	1	1	1	3
2026	1	0	1	0	1	3
2027	1	0	1	0	1	3
2028	1	0	1	0	1	3

- 1. Research & publications:** In addition to the already determined Scopus-indexed journal articles and other publications, the Department of Law faculty members plan to publish one journal, along with three authored and three edited books, in the next five years. The Department of Law has already started an academic blog edited by its students and supervised by full-time faculty members. The Department of Law also plans to establish a Research Centre to attract external funding and will hire research associates once the center is established. The detailed budget would accompany the proposal for the center.

Details of the Center: The name of the proposed research center will be '*The Center for International Human Rights.*' The proposed center will conduct research for promoting and ensuring international human rights. It will solicit funding from international development partners to conduct research on classical and contemporary human rights issues. Initially, the center will be staffed by:

- A Director (selected from among the full-time faculty members of the Department of Law);
- A Research Fellow (an internationally reputed human rights expert);
- Research active full-time faculty members of the Department of Law; and
- A Research Associate (a law graduate with prior research experience)

The following full-time faculty members will play an active role in the proposed center:

- Dr. Md. Rizwanul Islam, Professor, Department of Law, NSU
- Dr. Abu Noman Mohammad Atahar Ali, Professor, Department of Law, NSU
- Dr. Ishtiaque Ahmed, Associate Professor, Department of Law, NSU
- Mr. Arafat Hosen Khan, Chair and Senior Lecturer, Department of Law, NSU

- Mr. Saquib Rahman, Senior Lecturer, Department of Law, NSU
- Mr. Nafiz Ahmed, Lecturer, Department of Law, NSU

The remuneration of the research fellow and research associate will be decided according to university policy.

Details of the Journal: The Department of Law plans to publish a blind peer-reviewed academic journal dedicated to contemporary legal scholarship, primarily edited by full-time faculty members of the Department. The journal would require the creation of a separate website. It would also provide printed copies to the contributors. Subject to the approval of NSU, the Department plans to relax the teaching load of its Editor-in-Chief and Managing Editor to some extent.

Details of the Blog: The Department of Law has already established an academic blog edited by its students and supervised by its full-time faculty members. It has already received submissions from both internal and external scholars. The Department also plans to promote and maintain the blog.

2. Visiting scholars: The Department of Law plans to invite at least five internationally highly reputed visiting scholars in the next five years. The Department will maintain a flexible policy when hiring visiting scholars. Their honorarium and the terms and conditions of their contracts would depend on the individual negotiations and the university policy. Some general terms of their contract would include the following:

- Visiting scholars will not be required to act as course instructors. However, they may be invited to deliver lectures in their field of expertise.
- Visiting scholars will be required to produce at least one publication with NSU affiliations.
- Visiting scholars will be required to present, in a seminar, the findings of the research they will undertake during their stay at NSU.
- Visiting scholars will be encouraged to conduct collaborative research with the full-time faculty members of the Department of Law.

3. International conferences, seminars, webinars and symposiums: The Department of Law also plans to organize three conferences and about 100 seminars, workshops, talks, working paper presentations, symposiums, and webinars in the coming five years, the budget of which would be decided on a case-to-case basis at the start of each academic year. According to the current estimation, the Department of Law would require financial support of about BDT 3.5 million for organizing these events.

Research Targets

Target Categories	Targets
Journal Articles	30
SCOPUS-indexed Journal Articles*	5
Journal	1
Books	3
Book Chapters	10
Edited Books	3
Edited Volumes	0
Business Cases	N/A
International Conferences	3
Conference Presentations	40
Conference Proceedings	3
Policy briefs	N/A
Working Papers/ Presentations	15
Department Symposium/Seminars	12
Inter-institutional research collaborations (local)	5
Inter-institutional research collaborations with foreign universities/ Institutes	5
NSU research grants number	25
Extramural research grants	1
Establish new research labs or centers	1
Others (Research Seminar/ Webinars/ Workshop)	40
Total	202

*Scopus-indexed law journals and reviews are rare. Even the most reputed US law journals are often not Scopus-indexed. In previous meetings, it was agreed upon that law journals indexed in HeinOnline, LexisNexis, and West Law would be considered equivalent to Scopus-indexed journals.

Department of Political Science and Sociology & SIPG

Research Mission Statement of PSS and SIPG

- To produce leaders equipped with critical thinking, intellectual abilities, applied knowledge & ethical responsibilities.
- To facilitate the teaching and learning experiences that produce graduates of global standard
- The PSS department along with SIPG will offer a platform for the best academics and researchers in social sciences for academic and social advancement.

Research Goals of PSS & SIPG

During 2024 to 2028, PSS and SIPG will continue to be actively involved through research and extension with local and international Academic/ Research Institutions and strategic ministries in Bangladesh by providing policy analysis and research support to develop new and innovative tools and approaches to address different policy and development challenges. PSS and SIPG will continue to analyze political and social context in Bangladesh and the region, policy and governance issues and discourses (contemporary and historical) through Bangladeshi, South Asian, and international researchers, scholars, and experts. PSS and SIPG will strengthen networks and partnerships with national, regional, and international institutions for knowledge generation, dissemination, and capacity building. The long-term aim of the Institute is to establish its reputation as a world-class research institution for the study and practice of policy and governance, climate change, peace and conflict, migration, and other area studies. It would also work closely with different Schools of NSU to conduct multidisciplinary research.

Research Thematic Areas of PSS and SIPG

The planned research thematic areas of PSS and SIPG during 2024-2028 are:

- Policy and Governance
- Migration
- Society and Culture
- China-South Asia Relations
- Mental Health
- Climate Change
- Peace and Conflict
- Mental Health
- Religious and Society
- Ethnic Studies
- Media Studies
- Other Area Studies
- Interdisciplinary (to be undertaken in collaboration with other schools/ departments of NSU)

Dissemination

- PSS Department and SIPG will employ different types of dissemination through: Seminars, webinars, international conference: case studies as course materials and policy workshops.

Engagement (*rolling basis during the entire period*)

- Alumni engagement and through them strengthen linkages with private and public sectors.
- Build relationships with local and international stakeholders.
- Affiliation with Development Partners.
- Expanding affiliation with Academic/ Training Institutions at home and abroad.

Thematic Area Wise Planned Research of PSS During 2024-2028

Policy and Governance

- Civil Society's Involvement in Policy making
- Spaces for democracy (culture: social media: online digital platforms)

Climate Change

- Climate Change Effect in CHT

Peace and Conflict

- Cultural Competency and Mental Health of Rohingyas

Migration

- Climate change-induced migration in Bangladesh

Society and Culture

- Relations between Society and Religion
- Culture and democracy
- Understanding Cultural Heritage of Ethnic Communities in Bangladesh
- Intangible cultural heritage in Bangladesh

China-South Asia Relations

- Ethnic mapping on intangible cultural heritage in Bangladesh (Sylhet: Cox's Bazar: and Chattogram)
- Necessity of Chinese language in Bangladesh
- Chinese language promotion through the Confucius Institute
- Employment opportunities after learning Chinese language

Interdisciplinary Research

- Intellectual Property Rights and Copyright issues
- Technology, media, and politics

Religion and Society

- Effect of Religion on a Changing Society
- Religious Tolerance in Bangladesh

Media Studies

- New Media: Disinformation and Fake News

Ethnic Studies

- Understanding and Mapping of Ethnic Communities in Bangladesh

Strategic Research Goals of PSS During 2024-2028

Short-term Goals (1.5-year timeline)

- International Conference on “Navigating New Horizons: China – South Asia Connectivity in the 21st Century” in collaboration with Yunnan University
- Collaborative Research with Warwick University, UK on ‘mental health’
- Journal articles on:
 - Mental health in urban slums
 - Rohingya & host community perception
 - National Development experts and the Rohingyas
 - Islam and social changes among the urban youth
 - Poverty Narratives in Slums
- Special Journal Issue on Social Cohesion and Management of Refugees
- Working paper on Chinese Language Education in Bangladesh
- Research fellowship for potential regional and international academics/ researchers who will be given space in PSS to carry out joint research with PSS faculty (initial discussions are going on with potential academics/researchers)
- Understanding Cultural Heritage of Ethnic Communities in Bangladesh: A Pilot Study in Sylhet
- Comparative Research of *Public Sector Leadership and Development in Bangladesh, Indonesia and Vietnam*

Towards the end of 2024, PSS & SIPG will arrange a seminar to reflect upon the election and voting behavior in Bangladesh

Mid Term Goals (next two-three years)

- Strengthen the capacity of existing centers affiliated with PSS-SIPG.
- Get the inhouse journal- *North South Journal of Peace and Global Studies* indexed within next 3 years. Appoint a qualified editorial assistant. Add more international members and if possible, Nobel laureates to the editorial board.
- Expand International Collaboration (specific MoUs that can help the establishment of the research Centers/ institute.
- At least five international conferences or seminar arrangements to attract international community to show case- NSU and PSS and to strengthen and expand international collaboration and networking.
- Book Project on *Public Administration and Governance: Fifty Years Experience in Bangladesh* (initial outline developed and to be published by Routledge/ Springer)
- Research on Media and Fake News

- Introduce and popularise Certificate courses on: Winter School on Research Methodology
- Book on RMG and Returnee Migrants
- Book on Religious Tolerance in Bangladesh
- Collaboration with Yunnan University, China on ‘ethnic community’
- Books on:
 - Displacement and Refugee Issues in South Asia
 - Bengali book on China
 - Religious Tolerance in Bangladesh

Long-term Goals (4-5 year)

- Setting up an International Center for Advanced Research in Social Sciences (ICARSS) within PSS (*This will need an estimated seed money of around BDT 6-7 Lakh*)
- Effect of Religion on a Changing Society
- Religious Tolerance in Bangladesh
- Searching for research funding for research areas of PSS.
- Commissioned research.
- Research fellowship for potential regional and international academics/ researchers
- Local and international Research Collaboration and Specialization in niche areas of PSS.
- Book on Refugees in the Global Context

(It is to be noted that long term research strategy of PSS will be shaped by future local and international research partnerships and also proposals of annual research planning exercises)

South Asian Institute of Policy and Governance (SIPG)

Policy and Governance

- Civil Service
- Health Governance
- Electoral Governance
- Gender and Governance
- State and Society Relations
- Civil Society and Policy Advocacy
- E-procurement Implementation in Bangladesh
- Motivation to Join Civil Service in Bangladesh
- River Governance and Transboundary River Policy
- Evaluation of Current Education Policy of Bangladesh
- The Education Policy of the Ethnic Community

Climate Change

- Climate Diplomacy
- Climate Resilience
- Climate Change and Forced Migration
- Climate Change Induced Displacement
- Empowering Climate Migrants through Education for Sustainable Integration

Peace and Conflict

- Geopolitical shifts
- Religion and Society
- Female Autonomy and Subjectivity
- Micro-level Cooperation for Peace
- Rohingya and Demographic Shift in Teknaf
- Rohingya and National Security of Bangladesh

Migration

- Irregular Bangladeshi Migration to Europe
- Return Migrant Workers in Rural Bangladesh
- Bangladeshi Migrant Workers in Saudi Market
- Internal and External Migration of ethnic people in CHT
- Irregular Migration of the Stateless Rohingya from Bangladesh
- National and Sectoral Policies for Mainstreaming Migration

China-South Asia Relations

- Chinese Influence in South Asia
- Development of International Logistics Chanel in the BCIM Economic Corridor

Other Area Studies

- Bangladesh-India Relations
- Bangladesh-China Relations
- Bangladesh-South and South-East Asia Relations

Interdisciplinary Research

- Technology-based Research (AI, Big Data)
- AI Data Governance Policy of Bangladesh
- Cybersecurity in Public Institutions of Bangladesh

Nationwide surveys and research

- Urban Governance
- Governance Survey with CPD of Bangladesh
- Cultural Heritage of Ethnic Communities in Bangladesh

Regional Comparative Surveys and Research

- Trust Survey
- Transboundary Rivers of South Asia
- State of Democracy in South Asia (SDSA)
- Climate Change Induced Displacement Policy in South Asia
- Understanding the Arts and Cultures in Changing Democracy and Politics
- Designing Accountable and Ethical AI for South Asian Marginalized Communities
- The Security Impact of the Rohingya Crisis on Bangladesh and Regional States
- Micro-level Cooperation for Development and Security in South Asia

Introduce and Popularize Certificate Courses

- Certificate Course/Training in Negotiation
- Certificate Course/Training in Project management
- Training Program for Regional Civil Servants on Policy Analysis and Case Study Development

Short-term Goals (1.5-year timeline)

- Role of Civil Society in Policy Advocacy in Bangladesh
- Navigating Gender and Governance: An Intersectional Examination of Women in the Bureaucracies of Bangladesh, Nepal, Sri Lanka, and Bhutan
- Understanding the Electorate: A Comprehensive Analysis of Voting Patterns in Bangladesh
- State and Society Relations in Bangladesh: Challenges and Opportunities
- Is digitalization transforming the health sector in Bangladesh? Experiences from Selected Cases of Public and Private Hospitals
- Approaches and Policies on Climate Change induced Displacement and its implementation in South Asian Countries: A Comparative Study of Bangladesh, India & Nepal
- Designing Accountable and Ethical AI for Next Billions: Considering the needs of South Asian marginalized communities
- The *Orna* as a Disciplinary Tool: Female Autonomy and Subjectivity in Contemporary Bangladesh
- Climate Diplomacy: The Role of Local Media in Bangladesh
- Cultural Competency and Mental Health Management in Rohingya Refugee Camps in Bangladesh: A Qualitative Study
- Micro-level Cooperation for Development and Security – Revisiting Sub-regional Initiatives in South Asia
- Bangladeshi Migrant Workers in Saudi Labour Market: Free Visa, Economic Diversification, and Sustainable Development Challenges
- Unveiling the Shadows: Irregular Bangladeshi Migration to Europe and the Role of Human Smugglers
- Irregular Migration of the Stateless Rohingya from Bangladesh: Forces, Complexities, and Consequences

- Institutional Analysis Of Implementation, Monitoring And Evaluation Division (IMED) of The Ministry of Planning, Government of Bangladesh
- The Prospects for Democracy in Bangladesh and Nepal: Lessons Learned for Democratic Institutionalization
- Developing an Adaptive Cybersecurity Framework to Strengthen Multi Layered Defenses in public institutions of Bangladesh
- The Representations of Bangladeshi “Climate Refugees” in Global and Local Newspapers: A Critical Discourse Analysis
- Development of International Logistics Chanel in the BCIM Economic Corridor: Focusing on Panchagarh, Sylhet, Cox's Bazar, and Chittagong
- Assess and review national and sectoral policies to identify gaps in policy coherence vis-à-vis mainstreaming migration
- Evaluation of Impact of Senior Staff Course for Bangladeshi Joint Secretary level and Equivalent Public Servants in collaboration with Bangladesh Public Administration Training Centre
- International Conference with University of Manchester of UK and National River Commission of Bangladesh on *Transboundary Rivers of South Asia: Fostering Regional Collaboration for Environmental Sustainability*
- International Conference on *Digital Governance with ICT Ministry of Bangladesh* (This was planned in 2020 and had to be cancelled due to Covid 19 Pandemic)

Towards the end of 2024, SIPG & PSS will arrange a seminar to reflect upon the election and voting behavior in Bangladesh

Mid Term Goals (next two- three years)

- Book on:
 - Edited Papers of SIPG-NASPAA International Conference in November 2021 on *Preparing Public Leaders in South Asia for a Post Pandemic World*
- Strengthen the capacity of existing centers affiliated with PSS-SIPG.
- Expand International Collaboration (specific MoUs that can help the establishment of the research Centers/ institute.
- At least three international conferences or seminar arrangements to attract international community to show case- NSU and PSS and to strengthen and expand international collaboration and networking.
- Introduction of a Journal on Migration Studies to be launched by CMS
- Research on Motivation to Join Civil Service in Bangladesh
- Book on RMG and Returnee Migrants
- Collaboration University of New South Wales, Australia on ‘Bureaucracy, RMG, and returnee migrants’
- Collaboration with University of Arizona, USA on ‘Climate Change’
- Setting up a Centre for India Studies within SIPG (an initial seed money of around BDT 5 lakhs will be required for this).
- Design and Offer Certificate /Training courses on:

- Negotiation and Conflict Management
- Project management
- Program for Regional Public Servants on Policy Analysis and Case Study Development

Long-term Goals (4-5 years)

- Searching for research funding.
- Commissioned research.
- Research fellowship for potential regional and international academic/researchers as well as organisations (initial discussions are going on)
- SIPG will conduct more collaborative research with foreign academics and researchers from various countries worldwide during 2024-2028. SIPG will continue to run academic programs, conduct new research, organize international conferences, seminars, policy colloquiums, webinars, publish books, book chapters, journal articles, working papers, policy briefs, case studies, and conduct capacity building training programs and workshops with an aim to generate knowledge to strengthen and broaden the intellectual capacity of Bangladesh and regional countries at policy stage

(It is to be noted that long term research strategy of SIPG will be shaped by future local and international research partnerships and also proposals of annual research planning exercises)

Research Targets

Target Categories	Targets
Journal Articles	75
SCOPUS-indexed Journal Articles	50
Journal	14 issues of 2 journals
Books	2
Book Chapters	18
Edited Books	7
Edited Volumes	5
Business Cases/ Case Studies	25
International Conferences	5
Conference Presentations	20
Conference Proceedings	5
Policy briefs	15
Working Papers/ Presentations	5
Department Symposium/seminars	40
Inter-institutional research collaborations (local)	6
Inter-institutional research collaborations with foreign universities/	5

NSU research grants number	12
Extramural research grants	10
Establish new research labs or centers	1
Others (Webinars/ Workshop)	40